Vol. XXVII AUGUST 1933 Number 8

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EXCAVATING ENGINEER

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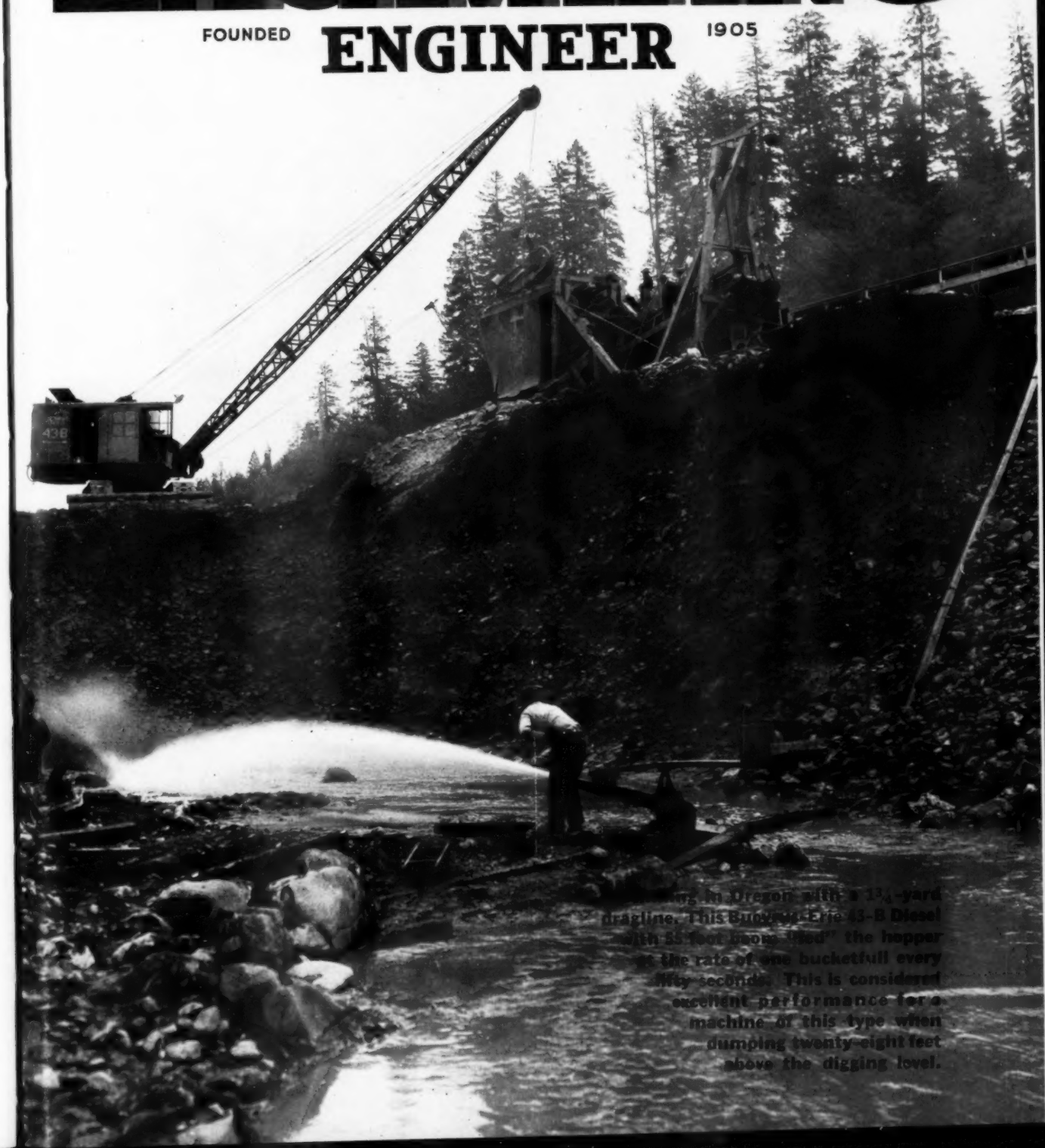

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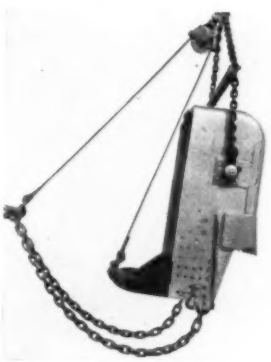

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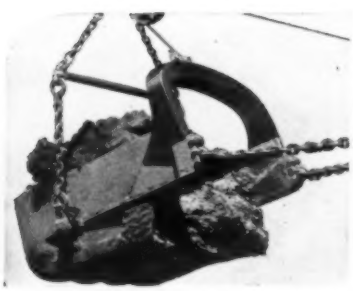

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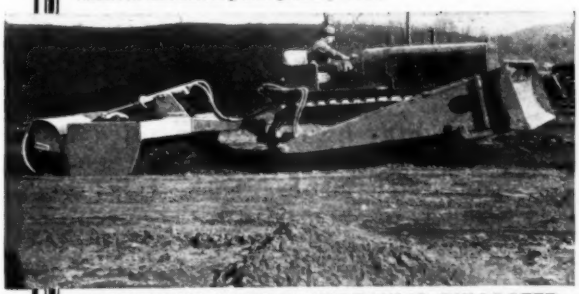

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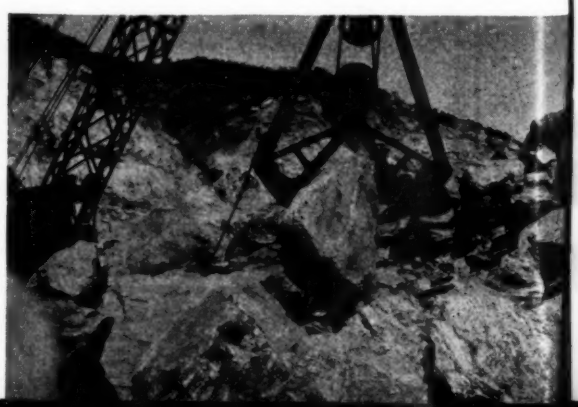

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of the

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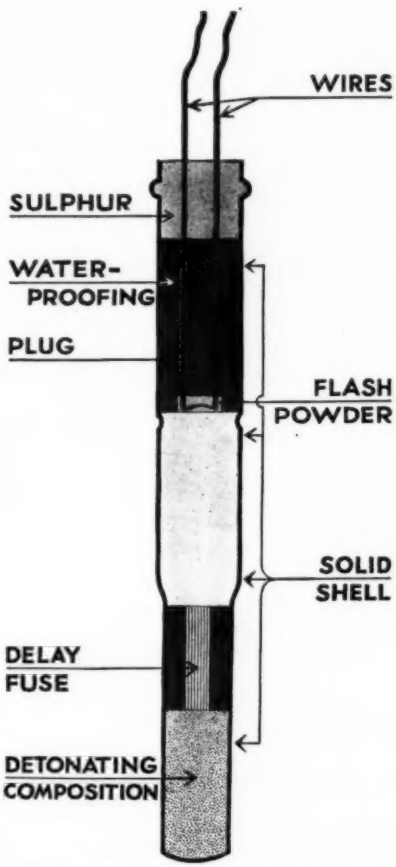

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J-2

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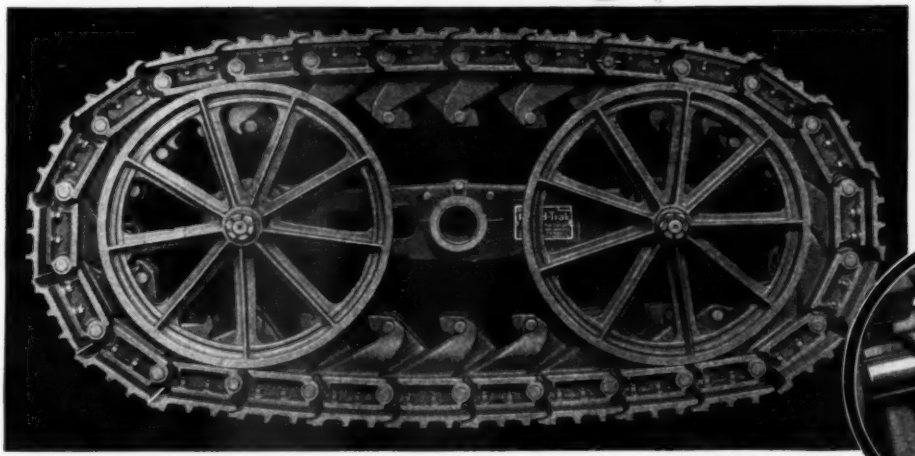

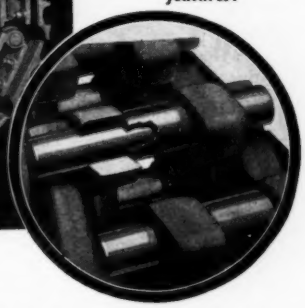

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The new Athey Forged-Traks are the biggest value ever offered by the world's largest producers of tracklaying wheel equipment. They run lighter — get over the ground faster—stand up under the toughest service you give them. They are the product of supreme engineering knowledge and skill. Investigate the new Athey Forged-Trak — then you'll never be satisfied with anything that offers you *less* than Athey!

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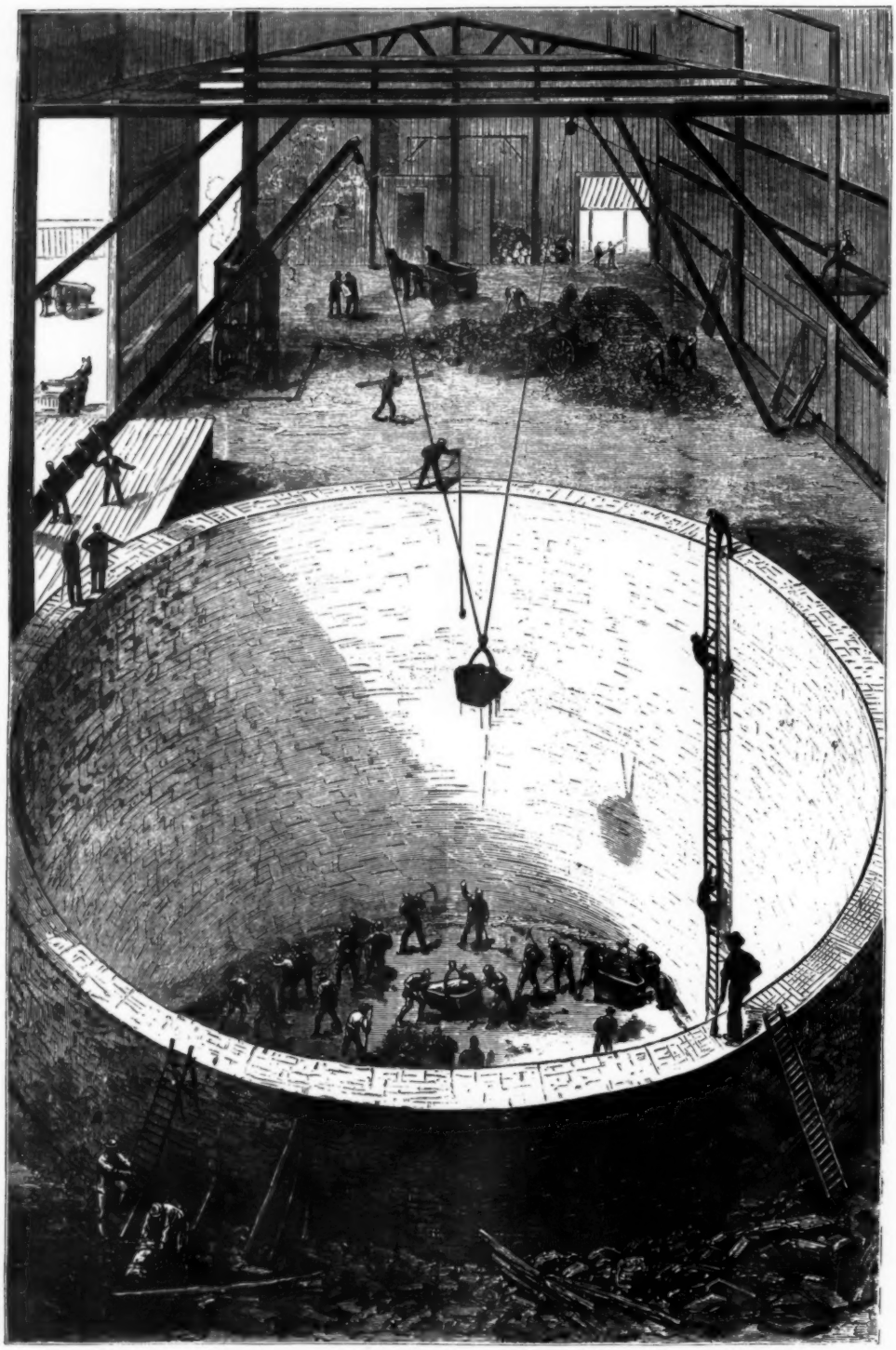

The Hudson River Tunnel . . . . *from the September 27, 1879 Supplement of Frank Leslie's Illustrated Newspaper. This interesting illustration shows the circular working shaft at Jersey City. It was 30 feet in diameter and was sunk to a depth of 65 feet. The tunnel, according to a description given at the time, was to be built 12,000 feet long, a mile of which was under the Hudson River with three-fourth mile approaches at each end. The bottom of the bore was to be 58 to 102 feet below the surface of the Hudson whose greatest depth of the water at that point was a little over 60 feet. It is enlightening to compare the methods used as shown in this old sketch with those employed in digging the world's longest tunnel, a twenty-mile water tunnel 500 feet below sea level. This gigantic undertaking of the Board of Water Supply of the City of New York was illustrated and described in Excavating Engineer for July, 1932.*

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Loading Stone at PENMAENMAWR

Penmaenmawr and Welsh Granite Company, Limited, uses Bucyrus-Erie 120-B to load stone from gigantic century-old Welsh quarries.

ON THE IRISH SEA along the north coast of Wales lie the Penmaenmawr Quarries carved out of "The Head of the Great Rock," a literal translation of its Welsh place-name. How appropriate this is you realize as you gaze up at the Great Rock towering over 1500 feet above the railroad line which skirts its base along the coast.

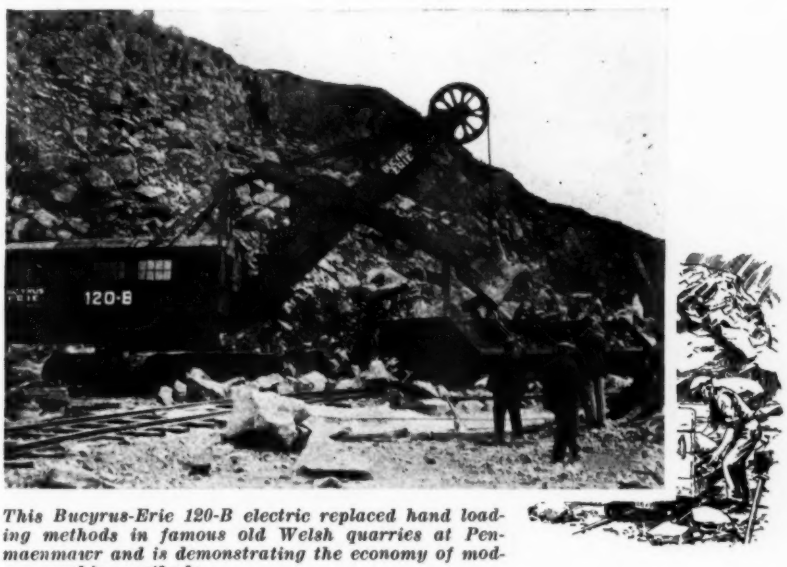
Over one hundred years ago Philip Whiteway, a geologist from beyond the Bristol Channel, happened to be on the shore of the Mersey Estuary watching a small Welsh coasting vessel discharging her stone ballast at the quay. Moved by curiosity he examined the boulders. Recognizing the value of the material he made inquiries which disclosed that the boulders were from the seashore at the foot of Penmaenmawr Mountain. He went there, investigated, and together with David Brundrit, founded the company of which the Penmaenmawr and Welsh Granite Company, Limited, is the present day successor.

This company operates several groups of quarries; Penmaen, Graiglwyd nearby, and the Trevor Quarry over at the other end of the county.

The stone, tough, hard, adhesive, impervious to water, is admirably adapted to sustain the wear and tear of heavy traffic; and long experience has proven to public road authorities that it stands in the very front rank of rocks for macadam purposes. But it has other uses. The owners make all sizes of setts, self-faced and tooled kerbs, channels and wheelers, ferro-concrete material, breakers and railway ballast. Seventy per cent of the rock consists of hard constituents.

Inclined railways carry stone down mountainside

Throughout these quarries there is a wonderful system of inclines leading from the top workings to the railway sidings and the piers. Each incline has two double sets of rails, which are almost automatic in their working, the loaded wagons in going down pulling up the empties. In each incline are three or four sections each terminating in a level platform, where cars from one section are unhooked and attached to the next hawser above or below as the case may be. Every section can thus be worked simultaneously, so that with four sections and two double sets of rails sixteen trains of wagons (two or three being attached to form a train) may be actually travelling on one incline at the same time, eight loaded going down, eight empties



This Bucyrus-Erie 120-B electric replaced hand loading methods in famous old Welsh quarries at Penmaenmawr and is demonstrating the economy of modern machine methods.

This shows a part of the "fitting" shop where machinery repairs are made, drills are sharpened, cars are built, and the entire plant is kept in perfect running order.

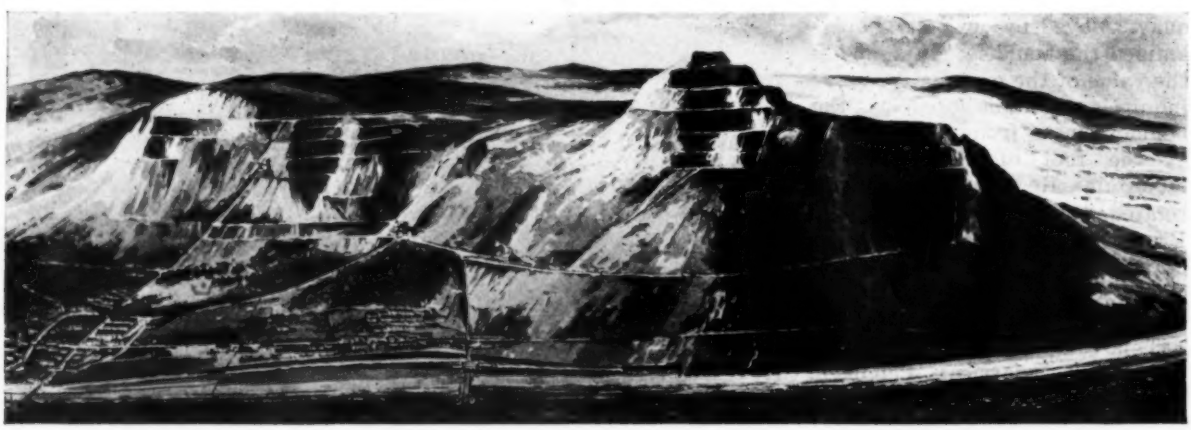
going up. Each loaded wagon carries two tons, the loading at the top and the tipping at the bottom, like the travelling on the incline, being almost wholly automatic.

Provided with a seat on one of the empties the visitor is whirled upwards from platform to platform, to a height of 1,200 feet. The inclines are very steep, the topmost having a rise of a foot to every 1½ feet. When four wagons are attached, the load going down weighs eight tons, and they occasionally travel at twenty-five miles an hour. But "safety first" is the rule. Each hawser has a braking strain of well over thirty tons, and is carefully tested every morning before being worked. The observation of this rule of "safety first" in every department accounts for the remarkably few accidents throughout the works.

Twenty benches with average 90-foot faces

The quarries are worked in "banks"—on the same principle as the "galleries" in a slate quarry. There are twenty such banks at Penmaenmawr averaging 90 feet in depth, each bank being practically a separate quarry. The rock is drilled by compressed air to a depth of 23 feet, and from ten thousand to seventy thousand tons of rock is brought down at one blast. The stone is conveyed to the crushing mills by locomotives, of which there are fifteen. The extent of the operations may be surmised when it is realized there are seventy miles of light railway on this mountain side, admirably constructed and maintained in excellent condition. The stone is brought to the crushing mills, and run down thence to large containers of forty thousand tons capacity. Thence again it goes to great shipping hoppers, each with a capacity of thirteen thousand tons. It is shipped from two piers into steamers at the rate of two thousand tons in the twenty-four hours. There are three railway sidings, with a total accommodation for two-hundred freight cars. The company has five-hundred cars, made in their own fitting shops. These fitting shops are well furnished, include smithies and joiners' shops, lathes, screw-cutting, drilling and

The stone is loaded to skips, there being two skips to a car. The cars are hauled by Diesel locomotives.



General view of Penmaenmawr quarries. The Bucyrus-Erie 120-B is working on the second level below the peak. At the extreme left is Graiglwyd Pier and sidings with the Graiglwyd Quarries, the Pencoed storage hoppers and the Penmarian Mill above them and to the right near the center is the Penmaen Pier and sidings with the Braichllwyd Mill above and to the left. Penmaen Quarries, East, are notched out below the peak and Penmaen Quarries, West, are below at the right. Lost in the shadows at the extreme right is the Llanfairfechan Mill and sidings.

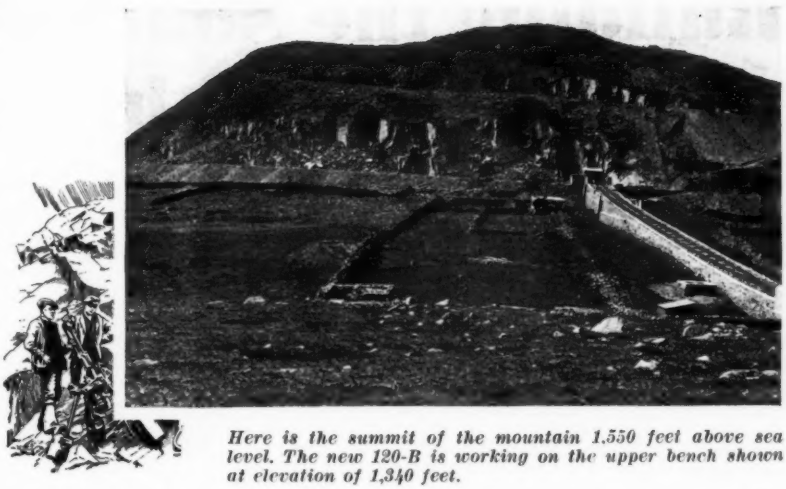
planing machines, all driven by electricity. At the foot of the mountain two inclines lead to the railway sidings, loading piers, and hoppers; and straight out to the pierhead where they can be discharged direct into the ship's hold. A water reservoir at a height of one thousand two hundred feet prevents any inconvenience from drought.

Five crushing mills with daily capacity of 3,000 tons

Large tar macadam works, and tar distillery in connection with the Penmaenmawr and Trinidad Lake Asphalt Company, of Liverpool, are attached.

Planks on the roof and across the back protect the 120-B from flying fragments of rock.

There are five crushing mills, with a daily output capacity of three thousand tons. The stone, as it comes from the quarry, is crushed and automatically classified into various sizes, ranging from 2 inches to ¼ inch—and even to dust. Everything is utilized, even the dust and fine chippings, which are used as "binding" on macadamized roads. The whole of the machinery is electrically driven, the voltage used being 2,200 and 500 A.C. The power for these is supplied by the North Wales Power Company—a very great advance from the old steam-power system.



Here is the summit of the mountain 1,550 feet above sea level. The new 120-B is working on the upper bench shown at elevation of 1,340 feet.

How "Setts" are made

The annual output of setts* has run as high as seventy thousand tons, distributed from Penmaenmawr over the whole of the United Kingdom. The Welsh settmaker is, by common consent, admitted to be the best in the world. One of the secrets of the Penmaenmawr quarries is that no man is called upon to do work which a machine can perform — and no machine to do what an expert hand can do better. No machine

*Stone paving blocks usually about 5 inches or 6 inches square.

(Continued on Page 317)

Looking down from the first incline over the storage hoppers, loading pier and part of the railway siding.

Building the South Jetty on the COLUMBIA

Interesting methods worked out by Columbia Contract Company in quarrying and placing 700,000 tons of rock to protect shipping channel at mouth of Columbia River.

IN MARCH, 1931 the U. S. Engineers made a partial survey at the entrance to the Columbia River below Astoria, Oregon to ascertain changes in channel conditions which might necessitate rebuilding of the south river jetty. A special board of engineers named to study the situation at the mouth of the river went into details in May and reported their findings and recommendations to Washington. As the old jetty was badly washed away and settled they recommended reconstruction of the south jetty and acting on this recommendation bids for tramway construction and delivery of rock were opened in Portland August, 28th, 1931. The job was awarded to the Columbia Contract Company of Portland for $1,204,605. On February 22, 1932 the initial delivery of rock was made.

The work consisted of repairing and enlarging the old jetty by dumping in additional rock. 700,000 tons were required and the contract called for furnishing this amount of material to form a reconstructed jetty 7,500 feet long. The rock was to be sorted and classified; 40 percent to be Class A rock in pieces from six tons and up, 40 percent Class B consisting of pieces from one to six tons; 20 percent Class C in 100 pounds to one ton sizes.

According to the Columbia Contract Company officials experience showed these husky 50-B steamers gave the best results in loading the stone. To obtain maximum benefit from their efficiency they were operated two shifts per day while the other loading equipment operated only one shift.

Unloading rock from the flat cars. Some of the rocks weighed from 25 to 33 tons, close to the weight of the shovels themselves but these sturdy little Bucyrus-Erie steamers shoved them overboard nevertheless.

Same quarry used in building original jetty

Columbia Contract Company had available as a source of rock their Fishers Quarry, considered one of the finest on the Coast for jetty rock. Rock for the original jetty was taken from this same quarry in 1900 and it has also been the source of material for many other similar contracts handled by the owners since that time. It is located on the Columbia River near Camas, Washington not far above Vancouver.

At the time the previous jetty work was done, stone was quarried high up on the hillside and taken down an inclined railroad to the river where it was loaded on barges and floated down to the desired location at the mouth of the stream. There it was reloaded into dump cars and run out over a trestle and dumped. The

Driving piles from the end of the trestel. The record run was eight 16-foot bents in a day.

remains of this old trestle may be seen in some of our illustrations.

The quarry property is about 80 acres with about two or three million tons of rock available. The face worked is about 2,000 feet long and the height about 60 to 120 feet. The quarry formation was of basalt rock averaging in weight about 165 pounds to the cubic foot or more than two tons to the yard. There was a small amount of overburden of sandy soil which was stripped with shovels loading to Linn tractors and with Caterpillar tractors equipped with bulldozers. The old method of barge hauling was not considered economical for use with the new contract and rail haul over the Spokane, Portland & Seattle Railway was selected as the method of handling. This, however, required the building of a one mile railroad spur track from the quarry to the S. P. & S. main line including trestle over the highway and railroad. This connecting track was built of 80 pound steel and carefully graded with ballast from the quarry.

A ton of rock per ¾ pound of powder

Drilling with Armstrong and Star well drills using six-inch steel, holes were put down from 75 to 125 feet. They were located 35 feet from the face and 25 feet apart. The drills averaged about ten feet per day per drill. After the holes were completed they were sprung and loaded with du-Pont 20 percent stumping black powder. 50 to 150 kegs were used to a hole depending upon the amount of rock to be lifted. Electric exploders were used for firing. In addition to the well drill holes from the top many coyote holes are used in order to obtain the necessary percentage of Class A rock. This method gave a larger percentage of big stone. Results of shooting may be noted from the illustrations. The average production was a ton of rock to three-quarter pound of powder.

Full-revolving shovels best adapted to work

Loading equipment consisted of a 100-C Bucyrus-Erie crawler mounted railroad type shovel, a 95-C Bucyrus-Erie crawler mounted railroad shovel, three 50-B Bucyrus-Erie full revolving, oil-burning steamers, one 30-ton Brownhoist crane and one 40-ton Ohio crane. The cranes were used for large rock only, the shovels handling all classes. Experience showed that the 50-B full revolving machines gave the best results for loading and these machines were operated two eight hour shifts per day while the other shovels and cranes operated

The large rocks were handled with cable slings which were placed by hand.

Two old time Bucyrus-Erie railroad type shovels on cats stood up sturdily against the heavy loading in spite of their age.

Above: Unloading a rock train on the tressel. The old tressel on the right was too badly rotted to be used. Below: Just after unloading the last car of a train, the crew of one of the unloading shovels poses for a picture. Note that the dipper door has been removed to convenience and to lighten the deadweight.

only one shift. All material was carefully sorted as loaded and this, of course, involved a great deal of extra work and considerably limited the production possible.

Stone was loaded to flat cars to which had been applied an extra top deck of heavy planking to protect them from damage from the large rock. An occasional side dump gondola was used to take care of the small rock. Waste was loaded to 16-yard Westerns and dumped on the property. Much of the rock had to be loaded by slings and these consisted of one-inch cable 30 feet long which are placed by hand on the selected stone.

The best loading record was the production of 63 cars in a day averaging 54 tons to the car. This gives an output of about 10 cars per machine. While in ordinary quarry loading where handling of large sizes and sorting of rock is not necessary, this would not be considered a very favorable production, under the requirements and considering the types of equipment used the contractors consider this production very satisfactory.

The cars which, except for the waste cars, were furnished by the railroad company, were switched in and spotted by the contractors with two Shay-geared Lima locomotives and a 38-ton Climax. The maximum grade in the quarry is four percent. As these trains were loaded the cars of rock were switched out and delivered to the S. P. & S. and hauled 127 miles along this line which borders the Columbia River Highway where they were delivered to the siding at Fort Stevens, Oregon. From this yard they are taken out twenty cars at a time by the contractor's switch engines over the long tramway out into the sea.

Driving piling, a difficult problem

The construction of this trestle presented considerable difficulties as the piles had to be driven into the rock of the old jetty. The old trestle while still partly in place was, of course, too badly rotted to be used. Piles for approach trestle were driven by two 55 H.P. double drum Clyde gas hoists and two 20 H.P. Clyde gas hoists were used for snaking in the piling and utility assistance. A steam pile driver was used for the rock trestle using Vulcan No. 2 hammer average 4 beats per day. The record for pile driving crew was a rate of eight 16-foot bents a day, a good record considering the difficulty in penetration which made it necessary to use heavy braces and lash the bents with cables. As the trestle was pushed forward toward the end of the jetty the rock dump proceeded directly following the con-

(Continued on Page 337)

Quarry Superintendent R. A. Lathrop and a car of Class A rock. An extra top deck of planking protects the flat cars from damage.

DRAGLINES help develop Oil Fields

Pure Oil Company builds levee to protect drilling and operating of Lost Lake field in Texas

By IRWIN LAMP

THE PURE OIL COMPANY is one of the major companies engaging in all phases of petroleum operations. Its producing activities cover nine states and include more than 5,000 producing wells. In Texas, which yields about 25 per cent of this country's crude, The Pure Oil Company is one of the principal producers. It also controls the entire output of the famous Cabin Creek Field which produces the highest quality of Pennsylvania grade crude known to the Industry; it has extensive operations in the Mid-Continent fields. These holdings insure its adequate supply of all types of crude for immediate and future needs.

It transports both crude and gasolines through large pipe line systems which it owns wholly or jointly. Marine and inland waterway's transportation is effected through operation of its ocean-going tankers and numerous barges.

Eight refineries are operated. They are advantageously located in different sections of the country and are equipped to take advantage of the latest developments in refining practice. Its blue and white stations extending from Canada to Mexico, from the Atlantic to beyond the Mississippi River, serve the motoring public with a complete range of quality petroleum products.

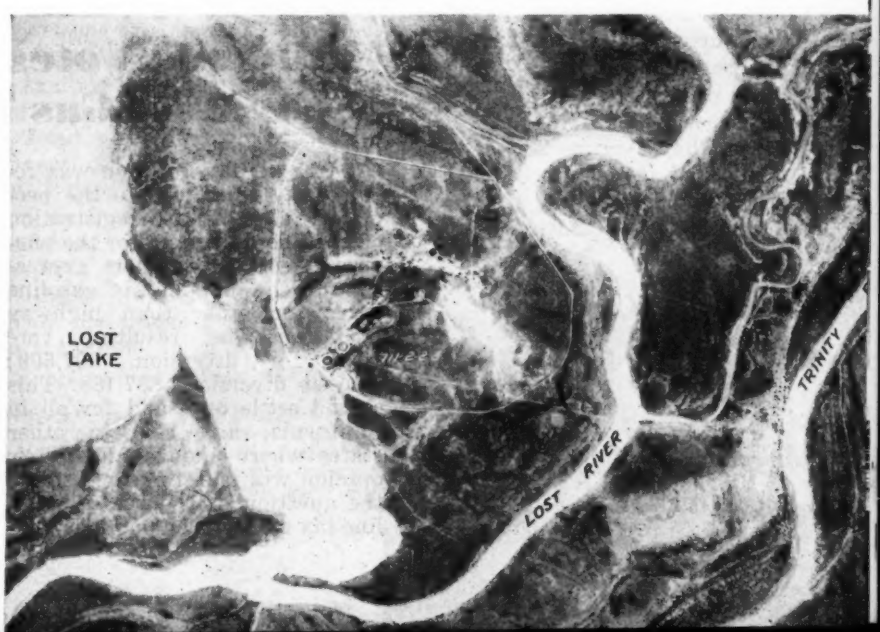
Where a company conducts activities over such a wide range, there are many interesting engineering and construction problems constantly requiring solution. One, for example, which recently came to our attention was presented in this Company's Lost Lake holding where it proposed to begin oil producing operations.

Diagram of Lost Lake Levee.

Building levee to protect 300 acres of oil land from overflow

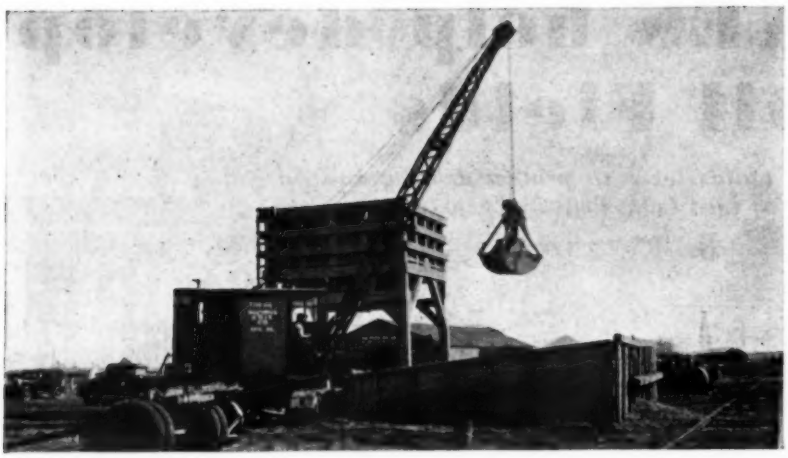
The Lost Lake salt dome and producing oil field is located in the Overflow Basin of the Trinity River, Chambers County, Texas, approximately ten miles upstream from Galveston Bay. The entire area is subject both to overflow from high tides and overflow of the Trinity River. For the purpose of developing and operating producing oil wells it was necessary to provide levee protection against the loss or damage of equipment and suspension of operations. The project was designed and executed under the direction of the operating department of The Pure Oil Company. The area of the field necessary to be enclosed by the levee was 300 acres. Required levee dimensions were: permanent settled height of 11 feet above mean low tide on an average ground elevation of 1½ feet above M.L.T.; 6 feet crown, slope varying from 1½ to 1, to 4 to 1 because of the varying quality of available material; length 14,000 feet. About 225,000 yards of dirt was moved which includes rehandling of material in some sections. There was a considerable variety of material ranging from sandy clay, excellent for levee construction, to marsh muck which was not only poor levee material but especially undesirable because of its instability as a foundation for levee structure.

A small levee was first constructed along the proposed traverse of the completed levee. It contained about 2 cubic yards to the linear foot and provided early protection from moderately high water as well as those elements necessary to effecting a water-



This picture, taken from an altitude of about 12,000 feet, shows all of small levee and portion of large levee completed. North at top of illustration.

BY EDGAR TOBIN AERIAL SURVEYS



Clamshell used in The Pure Oil Company's Van Zandt (Texas) producing operation —shown lifting gravel into an over-head bin in the warehouse yard for transfer to trucks going to the field.

tight seal in the completed levee. The completed levee was built over the smaller one and its muck ditch. A Bucyrus-Erie Gas+Air machine was used in this project. Due to rainy weather and the extremely soft condition of the soil it was necessary that the machine move and operate on wooden mats at all times. The machine was equipped with a 40 foot boom and 1¼ yard dragline bucket. Its performance proved very satisfactory in this sort of work.

Complete protection despite 80 days of flood

Very little pumping out is required as almost no seepage is evidenced even under flood conditions and precipitation is normally offset by evaporation. However, two pumps were installed, each driven with a 40 H.P. oil engine.

All productive wells in the field have been within the levee closure. They average 2800 feet in depth and initially produce several hundred barrels of oil per day. The levee functions as intended and allows "normal" operating conditions and methods in the Lost Lake area. Since completion, the levee has been subjected to a most severe flood condition in which overflow waters remained in excess of seven feet above mean low tide for a continuous period of more than eighty days. Complete protection was realized during this period. The construction of the project was under the supervision of B. Hennington, who is The Pure Oil Company's Lost Lake District Superintendent.

The Pure Oil Company also operates another Bucyrus-Erie machine (a 1025) in its Van Zandt field in Texas where it serves a variety of purposes. Some of these uses are as follows: serves as a crane in construction work; excavates for foundations in construction work and handles general excavating work, such as building of dykes; used in construction of roads where necessary to make fills of any magnitude; unloads pipe, sand, gravel and other material and is invaluable in the unloading, handling and setting of heavy machinery. Pure Oil engineers report that the operation of this machine has likewise been very profitable and satisfactory.

The water reached to within about 18 inches of the top of the levee during one of the flood periods. Water in the borrow pit remained at constant level.

Showing erosion and slumping of poor material.

California Votes Overwhelmingly Against Gas Tax Diversion

THE gas tax question was recently submitted to the people of California for registration of public opinion and for the purpose of obtaining their expression on the diversion of gasoline taxes for other than highway purposes. The resulting vote was: for diversion, 307,609; against diversion, 887,188. This should settle once and for all in California, and also in other states where undoubtedly public opinion will take the same stand, the question of the use of gasoline tax money. The public is willing to pay the gasoline tax just so long as these revenues are devoted to highway purposes exclusively.

The effect of the election in California will be immediate release of the California Highwav Department's program through the letting of contracts to make use of the accumulated funds. It is estimated that California will have available from present and future gas tax funds $100,000,000 plus $16,000,000 of Federal funds which will go to California under the National Recovery Act.

COURTESY KANSAS CITY TIMES

Scott Wilson

Missouri's Highway Chairman Pledges Efficient Administration

A thorough business training plus an intimate knowledge of Missouri's Highway System will make Scott Wilson a successful Highway Commission Chairman.

SCOTT WILSON, new Chairman of the Missouri State Highway Commission, has found the position to his liking. A job to be done—another in a career full of accomplishment. Missouri road building, with a 1933 program of $22,773,000 exclusive of possible additional funds to be available through federal relief legislation, offers an ideal opportunity to aid in unemployment relief.

Upon his appointment to the Chairmanship of the Highway Commission, Mr. Wilson said: "The Highway Commission has two major problems. The maximum number of jobs must be created for Missourians who need them most, and roads must be built at a minimum cost. All activity will be directed to this end."

Immediately all activity of the Highway Department was directed toward getting the program under way at the earliest possible moment. The result is that approximately $7,500,000 in road projects have been let to date, and additional work, outlined under the 1933 program, is being prepared and will be under actual construction this summer.

The Department is preparing to place under contract many additional miles of roadway as soon as federal funds are made available under the new Public Works legislation.

The Highway Commission is not political, but a bi-partisan organization composed of two Democrats and two Republicans and the State Geologist who is an ex-officio member. The efficiency of the Department is reflected by the fact that only 3.8 per cent of highway expenditures are required for administration.

More than two decades ago following his graduation from the Virginia Military Institute, Scott Wilson was given the territory of western Missouri to travel by the Carleton Dry Goods Company, with which company he remained, later as division manager for the state of Missouri until it discontinued business in 1926. Following this he accepted a similar position with the Rice-Stix Dry Goods Company, St. Louis in the same capacity. Thus it may be said that the new chairman of the commission has literally had a "front seat view" of the development of Missouri's highways. Mr. Wilson served with distinction during the war as second lieutenant with the 356th infantry, 89th division, and was in all of the major engagements in which his division participated. He maintains an active interest

(Continued on Page 317)

1. Route 17 is a splendid graveled highway in Miller County where this picture was taken. 2. An artistically designed grade separation in St. Louis County, Route 66 T. R. and 77 T. R. 3. A beautiful piece of concrete is Route 50 in Gasconade County. 4. Route 36 DeKalb County. 5. A splendid highway bridge carries Route 61 over the Salt River in Ralls County.

EXCAVATING ENGINEER

A Monthly Publication Devoted to Excavating and Allied Subjects

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The Business Situation

THE EVENTS of the last few days have convinced the writer more than ever that optimism and fear play a tremendous part in the variation of business activity. A few days ago General Johnson warned industry that, unless wages were advanced, the program for industrial recovery would face grave danger. During the next three days the stock market reacted violently, prices dropping over the entire list. The press pointed to the violent drop as a direct result of General Johnson's utterance. There can be little doubt but that the General's statement was the immediate cause of the stock market reaction, but it was far from being the fundamental reason.

For many weeks the Nation has been embarked upon an economic course which is in many ways experimental. In spite of the fact that the plan has been administered in a careful, conservative manner, it apparently has gripped the public's imagination and the result has been remarkable increases in stock prices and in business activity. It apparently has been the public's acceptance of the plan which has brought on increases in business activity rather than the operation of the plan itself. It makes little difference whether it was the announcement of the plan or the operation of it that brought on the increased activity, the important point is that in spite of all the plans for *control* of the increase, the optimism spread so rapidly that abrupt and violent rises began to show in most of the business indicators. These in turn gradually generated fear and caution in the mind of the public and, with these prevalent throughout the land, it needed only some slight confirmation to temporarily turn the tide.

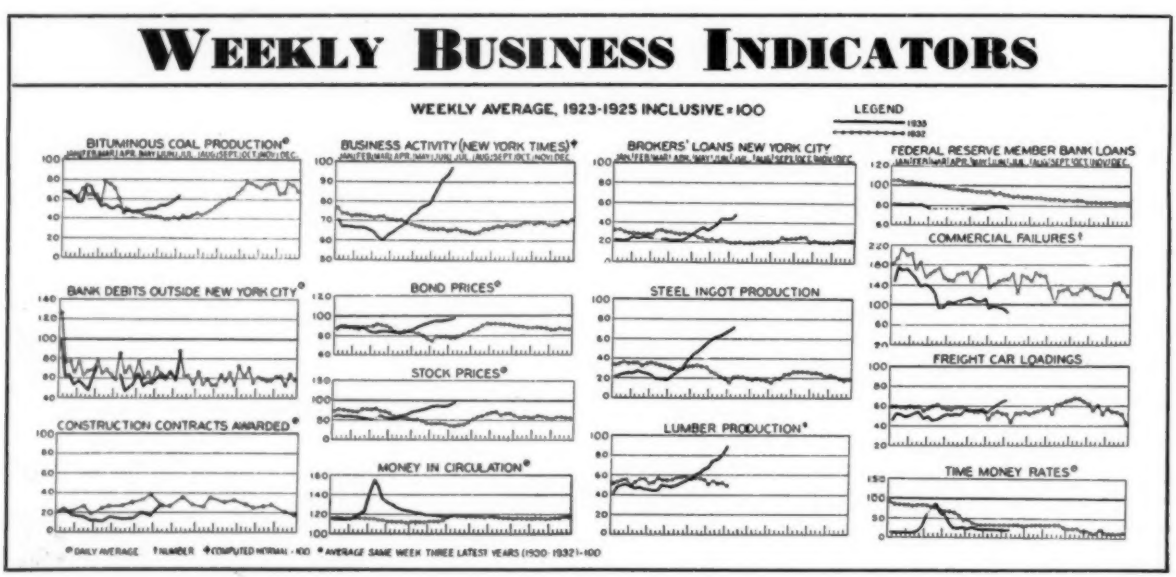
It is probable that American business will always advance and retreat spasmodically. It is doubtful that any method of control can be devised that will make adjustments rapidly enough to avoid these sudden fluctuations. Just as business activity has constantly risen and fallen in the past 140 years of which we have a record, so it will probably continue to rise and fall with a decreasing total variation. The increased understanding and the amount of control possible will be reflected in the smaller amount of fluctuation rather than in the violence of change.

* * *

Construction contracts of all descriptions awarded in the 37 states east of the Rocky Mountains during June totaled $103,255,400 according to *F. W. Dodge Corporation.* This was a gain of almost 34 per cent over the total of $77,171,700 shown for May. During June of last year the contract volume amounted to $113,075,000.

Breaking the June, 1933, contract total down, the Dodge organization indicates a total of $74,434,400 for privately-financed undertakings as distinguished from the total of $28,821,000 for publicly-financed work. Thus the total of private work during June compares with only $53,487,500 for May and $48,806,800 in June, 1932.

Showing a further distribution of last month's awards as between major structural classifications, the current report gives a June total of $27,793,200 for residential building as against $26,519,700 for May, and only $23,116,200 for June 1932; non-residential building awards during June amounted to $51,024,400 as compared with $31,639,400 for May and $39,812,600 for June, 1932; awards for public works and public utilities during June, 1933, totaled $24,437,800 as against $19,012,600 for May and $50,146,200 for June of last year.


WEEKLY BUSINESS INDICATORS
WEEKLY AVERAGE, 1923-1925 INCLUSIVE = 100
LEGEND
1933
1932
BITUMINOUS COAL PRODUCTION*
BUSINESS ACTIVITY (NEW YORK TIMES)†
BROKERS' LOANS NEW YORK CITY
FEDERAL RESERVE MEMBER BANK LOANS
COMMERCIAL FAILURES†
BANK DEBITS OUTSIDE NEW YORK CITY*
BOND PRICES*
STEEL INGOT PRODUCTION
STOCK PRICES*
FREIGHT CAR LOADINGS
CONSTRUCTION CONTRACTS AWARDED*
LUMBER PRODUCTION*
MONEY IN CIRCULATION*
TIME MONEY RATES*
* DAILY AVERAGE † NUMBER ‡ COMPUTED NORMAL = 100 * AVERAGE SAME WEEK THREE LATEST YEARS (1930-1932) = 100

J. C. Baxter Passes Away

It is with great sorrow that we record the death of John C. Baxter of New York. Mr. Baxter, member of Carey, Baxter and Kennedy, for many years previously connected with A. Guthrie and Company, known from coast to coast as a leader in the construction industry, passed away on July 26 from injuries resulting from a traffic accident in New York. Excavating Engineer joins Mr. Baxter's many friends and his business associates in paying homage to this man whose ability and character are best attested to by his success in life—his host of friends; we extend to his family and to his associates our most sincere sympathy in this bereavement.

Since Excavating Engineer was on the press when word of Mr. Baxter's death was received, the publication of a review of his life must be postponed, of necessity, until the next issue.

Pledges Efficient Administration

(Continued from Page 315)

in the affairs of the American Legion, retaining his membership in the William J. Bland Post in Kansas City. The new commissioner is a Missourian by birth; Belton being his birthplace. In his many years of residence in Missouri he has become well known to public leaders and merchants in every county in the state—almost every town or village where there is a general store. During his residence in St. Louis, Mr. Wilson was active in the trade development work in the Chamber of Commerce of that city, where his clear thinking won him his host of friends. He first became interested in highway work through intimate association with the late Murray Carleton of St. Louis, a former member of the State Highway Commission. His intimate knowledge of all parts of the state made him one of Commissioner Carleton's chief advisers and it was through this association that the present chairman learned much of the early development of the state roads organization.

In addition to the chairman the members of the commission include Arthur T. Nelson, Lebanon, (Col. Nelson is also Director of the State of Missouri Exhibit at Century of Progress in the Hall of States. Missouri has one of the finest exhibits, averaging 40,000 daily attendance); W. F. Phares, Maryville; R. S. Brownlee, Brookfield; H. S. Buehler, Rolla; E. E. Cramer, Jefferson City; Louis Stigall, Chief Counsel, St. Joseph; T. H. Cutler, Chief Engineer, and C. W. Brown, Asst. Chief Engineer, of Jefferson City.

Superintendent (indignantly): "Just look at the dirt under these bunks. It's been piling up for at least six weeks!"

Bull Cook: "Then it ain't nothin' to do with me, sir; I've only been here four weeks."

"I'll be frank with you," said the young operator when the embrace was over. "You're not the first girl I ever kissed."

"I'll be equally frank with you," she answered. "You've got a lot to learn."

Loading Stone at PENMAENMAWR

(Continued from Page 309)

yet devised can do what the settmaker does. The Welsh settmaker differs from his English brother in that the latter sits, and the former stands at his job, using his right foot as a third hand. For splitting large blocks he uses a sledge, but his main tool is a lighter hammer, which he wields with uncanny skill, some strokes so light as would hardly crush a fly, followed by a crushing blow which splits a block of granite a couple of feet thick.

Bucyrus-Erie 120-B replaces hand loading

Setts are trimmed by hammer work to given sizes, each size to a fixed gauge in length, breadth, and thickness. The craftsman does all his measuring by eye—no foot-rule or other mechanical measurement for him. And he never varies more than a quarter of an inch in the measurement of his completed sett. Each man has his own shed, well constructed, strongly roofed, affording good shelter in all weathers. There is no waste. All the chippings are swept up and sent either to the mill or to the man who attends to the incline winding, who in the intervals between the loads acts as a macadam stone-breaker.

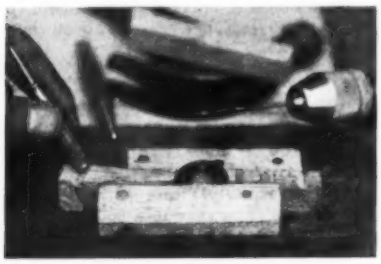
Until recently the stone has all been loaded by hand—the layout of the quarries and the sorting being well adapted to this type of handling. The development of modern quarry shovels led the Penmaenmawr organization to consider the economies possible with electric shovels. A Bucyrus-Erie 120-B 4-yard shovel was purchased from Ruston-Bucyrus, Ltd., and installed on the 1340 foot level in the East Penmaen Quarries with results fully up to expectations.

The machine loads the stone into skips which are carried on bogies on a 4-foot 8½-inch track. These are hauled by 80 H.P. Diesel locomotives to the big crushing mill where a 54″x72″ Crusher is installed. From the crushers it is taken by a 42-inch belt to a dump which holds approximately a thousand tons, and from the dump it is conveyed by means of small wagons on a 3-foot gauge track to the Penmarian Mill. In this mill the stone is crushed down to 1¾-inch and under by means of a 20-inch Traylor Crusher and Symons Cone Crushers. The small crushed stone is then taken down the incline to the storage hoppers, from which it is drawn as required for shipment.

FIELD NOTES

An Easily Made Small Vise

A SMALL vise is a handy thing, very handy indeed when you need one and are without it. Take the hacksaw and cut three strips about 3 inches long from any odd ¾ or 1 inch strip. Cut one of them diagonally making two slow wedges. Nail two of



the pieces down so that in addition to the part you wish to grip, you will have an inch or so drift on each wedge. This little arrangement will firmly hold any small piece you wish to drill, file or work on in a pinch. A nick cut in the larger end of the wedges will make them very easy to pull out when loosening the work.

—Frank W. Bentley, Jr.

Refrigeration Plant for 3,400,000 Cubic Yards of Concrete

A GIANT refrigerating system to cool off the concrete in Boulder Dam as fast as it is poured and set is being imbedded in the huge project.

Two-inch iron pipe, spaced 10 feet apart vertically and 11½ feet apart horizontally, is being installed as fast as the concrete is poured. Through this piping system cold water is circulated constantly to reduce the temperature of the concrete. Huge masses of concrete have the property of greatly increasing their heat after setting. Such a huge mass as Boulder Dam would require centuries to get rid of the excess heat without artificial aid, and the process would result in dangerous open joints or cracks.

Left to itself, concrete rises about 40 degrees Fahrenheit above its temperature when laid.

The system in Boulder Dam, when the whole project is completed, will entail embedding 800,000 feet of pipe for the water-cooling system—about 150 miles of 2-inch iron piping.

Experiments which led to including this cooling system in the specifications for the dam were conducted in the Owyhee Dam on the Owyhee project in eastern Oregon. Pipe 1 inch in diameter was placed there in each of seven consecutive 4-foot lifts of concrete. This concrete rose to a temperature of 118 degrees as it set. Pumping water at 64 degrees through the pipe system reduced the temperature to 84 degrees in two weeks.

Cellophane for Emergency Goggles

HOW cellophane bread wrappers were used to fill out a shortage in safety goggles while his crew scaled the sides and bottom of his ship in dry dock is told by John Henry Miller, boatswain's mate on the U. S. S. Quail, writing from Pearl Harbor, Hawaii. The men tucked the cellophane under their hats and used it as a mask. At first they laughed at it but it worked so successfully that by the second shift all of the men were wearing cellophane instead of the glasses which were of the open variety and did not give complete protection to the eyes.

Mr. Miller has also used cellophane for mask hoods on a job of sand blasting the ship's mine track and says that these worked successfully.

Responsibility of Dredging Contractors

FINDING that a woman had drowned in a Wisconsin lake in a hole dredged by defendant and left unguarded, at a point much used for bathing, the Wisconsin Supreme Court lately affirmed judgment in favor of her husband for damages. (Schumacher v. Carl C. Neumann Dredging & Improvement Co., 239 N. W. 459.) The court said:

"If a bather not knowing of its presence had been drowned from getting into the hole shortly after it was dug, there would be no doubt of the responsibility of the one who dug it and left it unguarded. But the plaintiff's wife got into the hole about six months after it was dug, after a winter had intervened during which, had barriers been placed when defendant left it, their destruction by pressure of ice would have been more or less probable. No questions were put or requested to be put to the jury covering the issues of fact to determine whether the lapse of time relieved the defendant from legal responsibility for absence of barriers at the time of the death. . . .

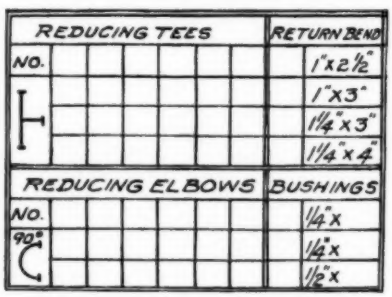
"The general rule is that an independent contractor is relieved from responsibility to persons for injuries suffered by them after he has completed his work and it has been accepted by his principal. . . . There is an exception to this rule, however, where the work constitutes a nuisance. A similar excavation situated in proximity to a bathing beach was held to be a nuisance in Nemet v. Kenosha, 169 Wis. 379, 172 N. W. 711.

—A. L. H. Street,
Attorney-at-Law.

Kink for Checking Materials

HERE is an ingenious and simple method for keeping a record of pipe fittings. This writer has never seen anything like it before. It was developed by an engineer friend who is with a large eastern engineering company.

For example, where reducing tees have three different sizes of openings, as often happens, the problem of recording those openings in an orderly manner has heretofore always been a stickler. The accompanying reproduction of a blank used by this engineer-



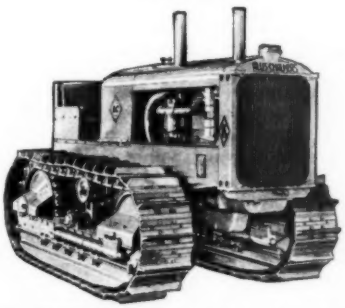
ing concern shows how easily it can be done.

Similarly, reducing elbows and return bends can be checked or recorded on the same blank. The blank therefore tells the whole story without the necessity of vexing explanatory remarks such as are to be found attached to the usual variety of records pertaining to fittings of this character.

—W. F. Schaphorst, M.E.

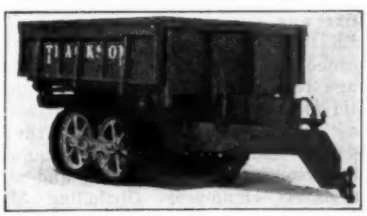
EQUIPMENT
You Ought to Know About

Allis-Chalmers New Model Tractor



A NEW model tractor developing a maximum of 48 drawbar horse power and a top speed of 4.50 m.p.h. has been announced by *Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin.* The new tractor, Model K, weighs approximately 11,000 pounds and its 15-inch track shoes give a ground bearing pressure of only 5.27 pounds per square inch. For a complete description of this new tractor together with specifications write the manufacturer, mentioning *Excavating Engineer.*

New 7 to 10½-yard 3-Way Crawler Dump Wagon



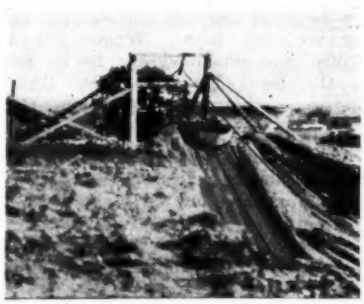
DESIGNED as an all-purpose crawler-equipped hauling unit, a 7-10½ cubic yard capacity 3-way crawler dump wagon has recently been announced by *Trackson Company, Milwaukee, Wisconsin.* The body is fabricated from ¼-inch high carbon steel plate and is especially designed for rock loading. The tops of all gates are double flanged, then reinforced to ½-inch thickness all around. As additional protection from the battering blows of material loaded, the side gates are topped with wood buffers encased in steel. The body floor is of the sandwich type, i.e., finished hard oak between top and bottom plates in order to cushion the buffeting of falling rock. Complete information on this new unit will gladly be furnished by the manufacturer.

Motor for Water Pumps

A NEW single-phase, fractional horsepower motor, specially designed for driving small water pumps, has been developed by the *General Electric Company, Schenectady, N. Y.* Outstanding among the features of this new Type RSA motor are drip-proof and flanges to prevent dripping water from entering the motor, a large bearing-oil capacity which makes oiling of the motor unnecessary more than once a year, and a built-in terminal box for simplifying installation by eliminating all necessity for splicing and soldering connections. The motor is available in one-sixth, one-quarter, and one-third horsepower ratings, with interchangeable mounting dimensions. Other uses than water pump service will readily be found for this new motor. For full partciulars write General Electric mentioning this magazine.

New Line of Drag Scrapers

THE NEW "Utility" line of Crescent drag scrapers, which embodies simplified design, has just been announced by *Sauerman Bros., Inc., 474 S. Clinton St., Chicago, Illinois.* In



this new line are five models ranging in capacities from 9 to 40 cubic feet and intended for operating spans ranging from 100 to 500 feet. They are said to be particularly suitable for use with the new type of portable and semi-portable screening and crushing plants and also for light excavating. For complete information write the manufacturer at the address given above.

New Allis-Chalmers Speed Patrol

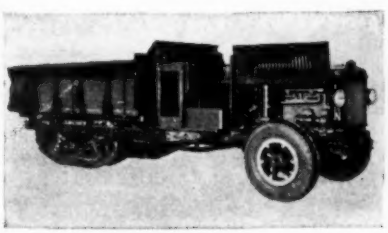
AMONG the features of the new Speed Patrol recently announced by *Allis-Chalmers Mfg. Company, Milwaukee, Wisconsin,* are ball and socket wear take-up joints on the complete mold-board assembly, 95-inch blade base, full power control, 42 horsepower engine, four speeds forward with a normal maintenance speed of 5 miles per hour, and dual brakes.

This new patrol is built in its entirety by Allis-Chalmers, permitting a new low sales price so the manufacturer claims to meet requirements of contractors, state and county highway departments. For complete data and specifications write the manufacturer, mentioning this magazine.

A New Diesel Powered Linn

RECENTLY announced by *Linn Manufacturing Corporation, Morris, New York,* is the model D-33 Linn tractor equipped with a six-cylinder Linn-Cummins high torque Diesel engine.

It is claimed that this improved Diesel is comparable in weight to gasoline engines of only 250 lbs. more than the six-cylinder gas powered model. The torque characteristics make it ideal for all classes of heavy duty hauling —yet it provides very flexible



power, responds to the throttle instantly, and is capable of sustained, trouble-free operation. This new tractor is available in body types for all classes of service. For further information write the manufacturer, mentioning *Excavating Engineer,* please.

SHOTS from the Firing Line

Special Provisions for Highway Projects under National Industrial Recovery Act

REGULATIONS for the administration of funds apportioned to the States for Highways by the National Industrial Recovery Act, provide special provisions to be added to the specifications for each project undertaken in whole or in part by such funds. Required provisions provide:

The contractor shall perform with his own organization not less than 80 per cent by value of all work in his contract, exclusive of unusual items requiring highly specialized knowledge, craftsmanship or equipment not ordinarily available. No portion of the contract shall be sublet, assigned or otherwise disposed of except with written consent. The contractor is to be responsible for compliance with special provisions of the contract by the subcontractor.

The contractor is to use articles, material and supplies mined, produced and manufactured in the Uniter States where available in commercial quantities and satisfactory quality. (A special exception under this provisional phrase is made of asphaltic material.) Preference is also to be given to the use of materials made under codes of fair competition authorized by the National Industrial Recovery Act.

Preference in the employment of all labor must be given to qualified ex-service men with dependents. All labor, skilled and unskilled, is to be employed from lists of available and qualified persons furnished the contractor by a designated employment agency specified by the United States employment service. However, qualified ex-service men with dependents and employees in an executive, administrative or supervisory capacity, may be employed without reference to such lists. An exception is made in case the designated employment agency fails to supply within 48 hours a properly prepared list containing a list of names at least 25 per cent in excess of the indicated requirements of the contractor. These employment lists are to show the name, residence, age and previous occupation in accordance with preference to (1) ex-service men with dependents, (2) citizens of the United States and aliens who have declared their intention of becoming citizens who are bona fide residents of the political subdivision or county in which the work is to be performed; and (3) citizens of the United States and aliens who have declared their intention, who are residents of the State, Territory or District in which the work is to be performed. Any skilled or unskilled laborer found to be incompetent can be discharged, but replacement must be made from lists furnished. Laborers obtaining employment as provided and performing the work satisfactorily, are not to be displaced because of any preference in employment which develops later.

A minimum wage will be set up in the contract for all skilled and also for unskilled labor. Wages for all skilled and unskilled are to be paid in the legal tender of the United States.

Skilled and unskilled laborers will not be permitted to work any more than 30 hours in any one week except that working time lost because of weather or shutdowns in any one week may be made up later in the calendar month. The 30-hours a week does not apply, however, to the operators of power shovels, power cranes, concrete paving mixers and dredging machinery, nor to skilled labor engaged in certain classes of work where exceptional skill is required to obtain uniformly smooth road surfaces such as master concrete finishers, master formsetters and blade grader operators for bituminous surfaces and on bases for such surfaces, unless skilled labor qualified to perform such duties can be obtained from the employment lists furnished. However, employment for these classes of skilled labor is in all cases to be limited to not more than eight hours in any one day or not more than 40 hours in one week. These provisions also apply to: roadside production of materials, whether by sub-contract or otherwise; hauling of material from roadside quarries, pits, railroad or water delivery points or from local sources of production whether the work be done by contractor or sub-contractor; concrete proportioning plants from which material is used wholly on this contract or under the supervision of the Department.

The provisions relating to the hours of employment do not apply to camp help; i.e., cooks, cooks' helpers, hostlers and stablemen.

The minimum wages are to be exclusive of any charge for medical examination or insurance. No individual employed on the project in other than an administrative position, is to be paid less than the minimum rate for unskilled labor.

Copies of all pay rolls for work performed under the contract, including work done by contractors, must be certified under oath by the contractor or his authorized representative and shall be filed with the engineer. These pay rolls will show the name of each employee, the State and the county of his residence, the agency from which his name was obtained, whether a veteran with dependents, class of work performed, hours worked each day, the wage rate paid and the total amount paid and deductions for board, if any. Pay rolls are to be divided in three sections under which will be grouped (1) executive, administrative and supervisory employees (including the contractor, superintendents, timekeepers, bookkeepers, clerical employees, storekeepers or other office employees in a position of special trust and responsibility, and the supervisory employees, foremen, master mechanics or any employees whose principal duties are to direct the work of others); (2) skilled labor (including all persons employed as operators of power-driven equipment other than passenger automobiles and trucks of not more than 1½-tons rated capacity, carpenters, masons, blacksmiths and all other persons employed at work requiring principally the use of special tools ordinarily used by persons skilled in a particular trade, any subcontractor who operates equipment or who works with the tools of any trade, being considered a skilled labor for the time engaged in such work); and (3) unskilled labor (including all labor not coming under the above classifications:

COURTESY ARIZONA HIGHWAYS AND H. S. CEDERBLOM

The Locating Engineer: "Where do we go from here?"

watchmen, guards and waterboys are considered as unskilled laborers). Pay rolls are to be submitted for each calendar month or part thereof not later than the 5th day of the following month. The contractor's time books are to be open to the inspection of the engineer at all times.

Provision is made for the maximum deduction permitted for board and lodging provided by the contractor or persons affiliated with the contractor. No deduction from wages from skilled or unskilled laborers are allowed on account of goods purchased or obligations incurred in any commissary or store owned, leased or otherwise controlled by the contractor. Charges at such stores are not to be in excess of a fair market price.

No fees are to be asked or accepted from any person who obtains work on the project nor shall any such person be required to pay any fee to any other person or agency obtaining employment for him. No skilled or unskilled laborer can be charged for any tools used except for loss or damage thereto.

Every employee will be permitted to lodge, board or trade with whom he elects. No charge is to be made for any transportation made by the contractor or his agents.

No individual is to be employed as a skilled or unskilled laborer except on the wage basis. This will not prohibit the rental of teams, trucks or any other equipment from individuals. No such rental agreement, however, nor any charges for feed, gasoline, or repairs from such agreement, shall cause any deduction of wages.

These provisions also apply on piece work, station work or subcontracts. The minimum wage is to be exclusive of rental of equipment which the worker or subcontractor may furnish.

Hand labor methods are required for: all clearing and grubbing of timbers less than 18-inches in diameter is to be done by hand labor or teams with the use of explosives permitted for the loosening of stumps. In grading, all trimming of slopes, cuts and fills is to be done by hand labor and ditches are to be trimmed by hand labor or teams. In subgrading all material windrowed between forms by blade graders or subgrade planers is to be removed by hand labor.

In the preparation of pipe or under drains, ditches for pipe 24-inches in diameter or less are to be dug by hand labor or teams with the use of explosives permitted. Such pipe, except cast iron, is to be unloaded and placed by hand labor with use of cranes, block and tackle and teams permitted. Back filling to be done by hand labor or teams.

On the construction of culverts, masonry structures and small bridges up to 50-foot span, cement and reinforcing steel is to be unloaded by hand. Aggregates are to be removed from stock piles to the mixer by hand shovels, wheelbarrows, carts or other hand labor or team methods. All carpenter and form work is to be done by hand methods. The use of steel forms, where allowed by the specifications, will be permitted. Concrete is to be transported from the mixer by carts or wheelbarrows with chutes permitted where allowed in the specifications. Finishing of structural concrete surfaces is to be done by hand methods.

Subgrading for curbs and gutters is to be done by hand or team and the concrete and concreting materials are to be handled as above.

All post holes for guard rails are to be dug by hand and where available posts are to be cut in the vicinity of the proposed work. Painting of the guard rails is to be done without the use of mechanical equipment. In applying drybound and waterbound bases and waterbound surface courses all filler is to be spread by hand and broomed into the surface by hand. In the case of surface treatments, retreads and mixed in place types, sweeping of the road grade is required to be done by hand or teams as is the sweeping of the base course. Chips are to be spread by hand.

Roadside production of crushed stone or gravel requires stripping by hand or team of earth from quarries and gravel pits with permission to use trucks of not more than 1½-ton capacity for hauling. Stone from roadside quarries is to be loaded by hand labor methods.

On large bridges all painting of steel work is to be done without the use of mechanical equipment and carpenter work and form work is to be done by hand with the use of mechanical saws at the bridge site not permitted. A provision also prohibits the use of mechanical and electrical drills for the use of boring holes in piles and forms at the bridge site.

The regulations also provide optional special provisions which may be inserted in the contract to permit substitution of a clause on the hours of skilled and unskilled labor, limiting employment to 130 hours in any one calendar month instead of the 30 hour per week clause given in the general regulations. This is intended to apply where unemployment has been absorbed in the area of the work and will be used on projects distant from employment centers where laborers would wish to board in the vicinity of the work. Another optional clause provides a work limit of 8 hours in any one day and not more than 40 hours in any one week. This will also apply to inaccessible regions where camps are established as customary or as a means of convenience.

Optional provisions on the subject of hand labor methods call for hand or team excavation of all earth material; team equipment or trucks of not more than 1½-tons rated capacity to be used for hauling excavated material and permission to use power excavating equipment and explosives in rock excavation. These clauses are intended to be used on projects especially selected as being well adapted to hand labor and team labor methods. In general such projects will be those involving excavation not to exceed 12,000 cubic yards to the mile or on very short jobs such as bridge approaches or minor line revisions and improvements. An optional provision is also offered for use where gravel will be produced with reasonable economy by hand or team methods by roadside plants specifying that the use of power shovels, clamshells and draglines will not be permitted in gravel production.

Another optional provision that culverts, masonry structures and all bridges provides that all excavation and back-filling is to be done by hand tools such as picks, shovels and wheelbarrows or team tools such as scrapers and carts. Explosives will be permitted and also power operated pumps where necessary. However, provision is made that excavation more than six feet below normal ground level can be removed by mechanical means.

The optional provisions are to be inserted where considered advisable by the State Highway Department with the approval of the District Engineer of the Bureau of Public Roads. The required provisions which preceded these are mandatory, however, on all highway contracts under the National Industrial Recovery Act.

Highway Construction Provided by Public Works Bill Getting Under Way

ACCORDING to a report from Thomas H. MacDonald, Chief of the Bureau of Public Roads, practically every state is ready to proceed with projects provided under the Public Works bill in the National Industrial Recovery Act. Some delay has, of course, been unavoidable pending the formulating and release of Rules and Regulations and Special Provisions governing the work.

Among the July lettings under the Emergency Appropriation of 1932 were:

Arkansas let approximately $1,000,000 of highway construction on July 20th; Iowa had a letting July 5th; Massachusetts July 11th; Montana July 12th; Nevada let jobs totalling $500,000 July 5th and 6th; New Mexico $230,000 on July 6th; North Dakota $380,000 on July 21st and Oklahoma $450,000 on July 5th.

Exhaustive Survey Shows Industry Magnitude

EVERY TENTH person gainfully employed in the United States in 1929 depended for his livelihood on construction; of the total of $11,000,000,000 of construction in that year, the greater part was wages. Further, just as much employment was furnished in-

directly in dependent industries as was created by actual construction work.

This information was presented by Robert D. Kohn, past president of the American Institute of Architects, and General Chairman of the Construction League of the United States, which met recently at Chicago.

The Construction League has just made the first really exhaustive survey of construction, obtaining the figures in Washington in the various government departments. Construction paid $7,000,000,000 to 4,500,000 persons in 1929 out of the total of 48,800,000 gainfully employed. Over half of these workers were engaged in direct construction.

Though the bulk of construction work is done in large cities and industrial areas, the indirect employment afforded in the manufacture of materials, in transportation and in distribution, is as great as the employment on the construction site. The production of raw and finished materials is carried on in every section of the country, in towns far from structure or project. For example, a study of the materials sources for Boulder Dam reveals lumber from the northwest, steel work from Ohio, Illinois, California, Pennsylvania and Alabama, turbines from Wisconsin and Virginia, electrical equipment from New York, valves from Tennessee, and the cableway from New Jersey.

In 1929 the raw materials production for construction engaged over 60,000 persons, mostly in the mines and quarries. The value of their products was a half-billion dollars. These unfinished stone, ore and mineral products went to the manufacturing industries, which converted them, together with forest products, to finished materials, valued at three and three-quarters billions of dollars. In this manufacturing process 1,100,000 people were engaged, or one out of every ten occupied in all manufacturing industries; the materials were being made in one-fourth of the mills and factories of the country.

As a complement to the manufacturing division of the survey, a study of coal consumption by the materials producing industries was made, revealing that 5 per cent of all coal mined in 1929 was used for these materials and that 25,000 people were employed in its production.

Transportation of construction materials is the next logical step in the construction process, and employed 180,000 men on the railroads, moving 6,800,000 carloads of raw and finished construction freight, or roughly, one out of every five carloads for 1929. This transportation was responsible for 14 per cent of all freight revenue.

Engaged in wholesale distribution of the construction materials were 125,000 persons, reporting net sales to the Census Bureau of $3,129,000,000, part of which was redistributed by 310,000 workers in retail establishments. This distribution group furnishes 10 per cent of all construction employment and is one of the most widely dispersed divisions. The design of buildings, structures and projects of all kinds occupied 145,000 architects, draftsmen, engineers, and designers in 1929, representing 3 per cent of the construction employees.

Of the $11,000,000,000 of construction, contractors built a little more than half, the remainder being done by railroads, public utilities companies, municipal governments and the like. Direct employment was 2,500,000 men. New York, Pennsylvania and Illinois led in number of employees on contract construction work.

Public Works Highway Program to Release $200,000,000 to Payrolls of Suppliers

INDIRECT but assured wages totaling more than $200,000,000 over and above payrolls to road-builders actually on construction sites today were developing from the Federal Emergency Administration of Public Works highway program.

Tracing the job creating travels of the highway dollar, the public works administration found more unemployed will be called back to payroll on these indirect jobs than would ever be counted in the road camps themselves.

Production and transportation of materials and equipment form the backbone of the indirect work generated by the road-building for which the actual cash is now going out. Every state shares in these new jobs which were opened without delay.

Col. Donald H. Sawyer, temporary administrator of public works, outlined the notable job-producing character of activities which the $400,000,000 fund allocated states for highway construction will arouse. At their sources materials required for building approximately 25,000 miles of highways from this fund have small value, he said. A large volume of manual labor is necessary to give them proper form and move them to sites available for the road-builders.

To achieve the spirit of the public works act and obtain the greatest possible production of jobs from the expenditure, the administrator studied records, covering highway construction during the past three years under emergency conditions. These up-to-date records show thirty-thousand man-hours of work required for construction of one mile of average highway. Less than eleven thousand man-hours for a mile are required at the actual construction site, while the balance develops from the indirect jobs.

Blowing whistles calling men back to work on these indirect jobs resulting from highway construction will bring new vigor to many industries, including those dealing with steel, cement, explosives, gravel, crushed stone, fuels, sacks and bags, ore, gypsum, limestone, sand, power, asphalt, brick and wire.

Advance estimates indicate construction of 3,000 miles of concrete pavement, including bridges and other necessary structures, will involve transportation of approximately 12,000,000 tons of freight involving all movements of materials from the raw state to the place they are finally utilized.

Indirect labor as differentiated from work on the construction site will comprise the greater part of the total expenditures for payrolls on certain types of highway operations under the program being rushed to completion, the administrator was informed.

Canada

Quebec Notes

As a means of unemployment relief and at the same time **improving the eastern section of the trans-Canada Highway**, the Provincial Governments of Quebec, New Brunswick and Nova Scotia have agreed tentatively to improve the route from the western boundary of Quebec to the eastern terminus at Halifax. The improvements are to include paving of sections now gravel surfaced, and constructing routes through municipalities whose budgets heretofore have not provided for adequate road surfacing. In realization of the plan, the Dominion Government will assist up to fifty per cent of the estimated costs.

New England Notes

By J. R. PARKER

Three Bucyrus-Erie B-2 shovels are used by **R. H. Cone Inc.**, Hartford. Here is one of them digging in to start excavating on the new $300,000 Temple Beth Israel on Farmington Avenue, Hartford, Connecticut which will employ about two hundred workmen. About eight thousand yards of dirt will be moved. The engineer is Joe Sullivan who has been with R. H. Cone for the last ten years. The general contractors are the Southern New England Contracting Company of Hartford.

By J. C. ALEXANDER

James J. Coughlan & Sons, Inc. of Boston were awarded the trunk sewer job in Rutland and Holden. This job is about ten miles long.

T. Stuart & Sons have about completed the large sewer job in Newton, Massachusetts. Excellent progress has been made on this work by this company.

Carlo Bianchi & Company of Framingham, Massachusetts, have made some new records in laying concrete pavement with their double drum paver, on the Newton and Wellesley jobs.

S. W. Lawrence, Woods Hole, Massachusetts has been awarded a section of state highway at Eastham, Mass. Mr. Lawrence has speeded up his job at Yarmouth, Mass. recently by adding

The cut shown in the picture was seven to eight feet in depth and was taken out by the wheeler train, no auxiliary equipment being necessary except a blade machine for smoothing the grade. The rear wheeler of the train, in the picture, has been loaded and the operator is pulling the rope control that will bring the pan to carrying position.

ONE MACHINE *for the* WHOLE JOB
the Western Power Wheeler

The Western Power Wheeler is capable of handling the average small dirt-moving job alone. It is self-loading, spreads its load on the dump and takes the place of other loading and hauling equipment. It will handle almost any material except rock and is economical on both long and short haul work.

The Western Power Wheeler is built in two sizes of 1¼ and 2 cubic yards capacity which are alike except for size. The 2-yard Wheeler should be used with a 60 H.P. tractor and the 1¼-yard with a 35 H.P. tractor. In either case, 4 wheelers in train formation can be operated behind the tractor, using only the tractor driver and one other man. This outfit can do all the dirt moving.

Bulletin 33-BK, giving complete description, is yours for the asking. Write today.

Western Wheeled Scraper Company

Dump Cars and Grading Equipment

Aurora, Illinois, U. S. A.

WESTERN

For your convenience in writing to Western Wheeled Scraper Co., you will find a card bound in this issue.

Shots From the Firing Line— *Continued*

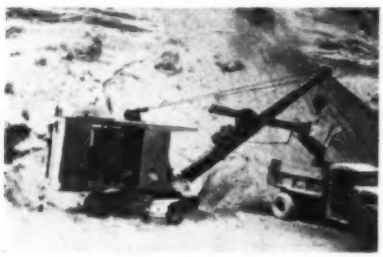
a 21-B Bucyrus-Erie gas shovel to his shovel equipment.

We were sorry to hear that **D. J. Keefe** has broken a bone in his ankle. However, this is mending rapidly and Mr. Keefe's leg will be as good as ever in a short time.

Louis Julian has been working with the Gas+Air shovel for the C. & R. Construction Company.

C. J. Maney Company has practically completed all of the grading on its road job in West Roxbury. Eddie Thompson and Guy Sheaf are handling the two Bucyrus-Erie shovels used for this work.

New York Notes



Joseph O. Moran, who is operating a shovel for Contractor Michel Cristo, sends us the above snap shot of an eight-year-old Bucyrus-Erie Gas+Air digging fill for the New Albany Post Office. Mr. Moran tells us that this machine, in spite of its eight years of service, "is still going strong."

Philadelphia and Vicinity

By M. G. CONWAY

It seemed like old times to be driving up Ogontz Avenue in Philadelphia and see **Joe Herzog** at 78th Avenue with his Gas+Air and four Mack trucks handling 7,500 yards of excavation on a new building operation of about twenty houses. This is the first operation of any size at all in that vicinity in the past three years.

Things must have been going all right because Joe had a very pleasant smile and advised us that he was going to make some money on the job and had prospects of two or three other excavating jobs.

Baltimore and Vicinity

By S. M. CHRISTHILF

The Pennsylvania Railroad Company has ordered the **Arundel Corporation** of Baltimore to resume operations on the Hoffman Street Tunnel and electrification work through Baltimore to Washington. This work was started in 1931 and shut down after partial construction had been affected. The starting of this project again has helped the local situation considerably as other work in the construction field is expected to come up shortly. The above project is part of the Pennsylvania Railroad's $22,000,000 improvement program.

Ohio Notes

A grand total of $368,000 in **bridge construction and highways** on federal routes is included among the state highway department road projects let July 28th, Highway Director O. W. Merrell announced. The projects will be financed by Federal Aid money and by Federal emergency funds, the latter left over from 1932. The contracts will be the first state highway construction and bridge work let since December, 1932, and will replace the proposed March, 1933, lettings advertised but later cancelled on account of the bank holiday.

Michigan Notes

By CLYDE B. DAVIS

In its first meeting since Highway Commissioner Murray D. Van Wagoner took office, **the highway committee of the State Administrative Board** set aside 12 projects planned by former Commissioner Grover C. Dillman and concurred in nearly 60 previously approved. Three new contracts were awarded, two for about $270,000 of paving and one for a bridge on M20 near Bay City. **The Michigan Construction Co.**, South Haven, and **J. H. Baker & Sons**, Port Huron got the paving

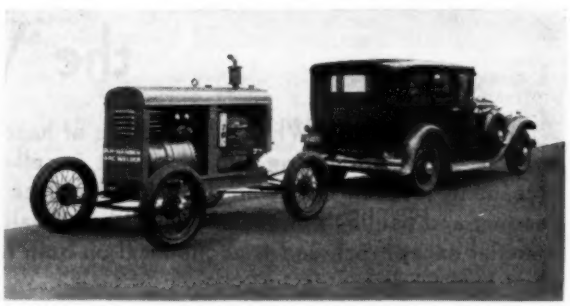
A Machine for Shifting and Raising Your Track

If you are operating a quarry or open pit mine, engaged in a construction job where track must be raised and shifted frequently, here is a money saving investment. It is no longer necessary to maintain a large labor gang for this work. No longer need there be delays to your other operations. This machine and a few men will do the work, saving you time and money. If you shift or raise track, you need this machine.

NORDBERG MFG. CO., Milwaukee, Wis.

THE NORDBERG PATENTED TRACK SHIFTER

TAKE 'ER ANY PLACE



The P & H-Hansen Arc Welder is completely self-contained. Makes its own power—travels on its own wheels. Just hook it on behind a car or truck. And once on the job, it's ready for any kind of welding: heavy castings or light plate, structural steel or machinery repairs. Write for new catalog "Weld It Well."

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AMERICA'S FINEST FASTEST WELDER

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faster moving . . .

The full caterpillar mounting and faster set-up of Bucyrus-Armstrong drills cut down the moving time. So stable is the machine that practically all moves are easily and quickly made — up steep grade or across irregular or soft ground. The individually driven caterpillars together with the pivoting axle permit a great amount of flexibility when moving and allow leveling up the machine on uneven ground for "set-up". Stabilizing-jacks are part of the machine, securely attached to the rigid frame.

Visit operations similar to yours where these new drills are at work . . . talk to their owners . . . watch them drill and move . . . ask the men on the job about their performance and the large savings they make possible.

greater footage . . .

Large hole drilled at a speed that ordinary machines accomplish only on smaller hole. Here are just a few of the features that contribute to the new standard of output capacity set by Bucyrus-Armstrong drills: ample power with sturdy construction to back it up . . . all-steel cable and rubber shock absorbers that cut cable expense 75 percent and make delays a rarity . . . correctly designed bits, mechanically sharpened to accurate shape and gauge.

lower drilling costs!

Performance records prove that the output of any blast hole drill over five years old is less than half that of modern Bucyrus-Armstrong equipment. Drilling cost per ton of blasted material can be reduced more than 50% by the use of these all-steel drills. Send the coupon for complete information. Bucyrus-Erie Company, South Milwaukee, Wisconsin.

BUCYRUS-ERIE COMPANY, South Milwaukee, Wis.
I would like to know more about Bucyrus-Armstrong:

☐ **All-steel blast hole drills.** ☐ **Bit sharpeners.** ☐ **Tools.**

Name ..... **Title** .....

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Shots From the Firing Line—
Continued

jobs and the bridge went to G. C. Hess, Akron, Mich.

The state has $12,736,227 in Federal funds, which it need not match, for construction this year and about $300,000 which it must match. The new commissioner expects to cut the $3,000,000 which the old administration estimated would be available from state funds, and it is doubtful if all the Federal money will be used this year, since the paving season closes Oct. 15.

Hereafter the highway department will handle all financial matters relating to the department. This was announced following cancellation July 11 by the public debt commission of a contract with Stranahan, Harris & Co., brokers, for the refunding of $10,000,000 covert road bonds. The new commissioner is consolidating departments and reducing the personnel as rapidly as he can find a way to do it practicably.

The Mogul, big Bucyrus-Erie dipper dredge, has made a tremendous hole in the dirt at the foot of Lake Huron, where 1,767,000 cubic yards are to be taken out before the end of October. This job is being done by Mr. Dodd of the **Great Lakes Dredge & Dock Co.**, with a force of 75 men between Point Edward range light and a point five miles out into the lake. Around on the other side of Detroit, the **Duluth Superior Dredge Company** has the hydraulic dredge Niagara at work on a 25-foot channel from the upper end of Lake St. Clair three miles out.

A county contract is to be let soon to replace with a concrete bridge the 60-foot iron-and-wood bridge which crashed into the Flint river late in June under the weight of a heavy truck and two gasoline trailers. The bridge had stood a heavy battering 54 years, although built for horse-and-wagon days. Workmen pumped out 1,760 gallons of gasoline after the crash.

Patterson Engineering Co., Detroit, has sub-let the excavating at the new water plant, Cambridge, Pennsylvania, to **Frank Ryan, Inc.**

Getman Bros., South Haven, have the $32,035 sewage disposal plant contract for that city. Work started July 1 and must be finished by November 1. The price was exclusive of pipes and special castings.

Ward A. Detwiler, president of Bryant & Detwiler, Detroit general contractors, has been elected a director of the Detroit Board of Commerce.

The Baxter Cartage Co., Cadillac, has been awarded the job of grading and draining structures from US10 to Hersey. This concern is now working on M55 west of Cadillac.

The subway and other important proposed work in Detroit has been sidetracked temporarily to get men at work as soon as possible on widening in the downtown districts of Michigan, Gratiot and Woodward Avenues, which lead into superhighways more than 200 feet wide farther out. The Woodward job alone will amount to more than $12,700,000. All of the projects come within the purview both of the RFC and the National Recovery Acts. Interest alone on the Woodward property condemned is piling up at the rate of $500,000 a year, since the verdict in 1932 after a long court fight. For the first time the Common Council has acted unanimously to get these three big projects underway as soon as possible.

Kentucky Notes
By W. E. CHAMBERS

The State Highway Commission rejected all bids for grading and draining 5½ miles of the left Beaver Creek Road in Floyd County and set aside $57,000 for handling the work direct. Floyd County will advance $50,000 for the project.

Bids were also rejected on 8 miles of grading and draining in Barren County on the **Jackson Highway-Fountain Run Road** between the junction with U. S. 31-E and Tracey estimated to cost $17,877 and on 10.2 miles of grading and draining estimated to cost $34,085 on the Garfield-Vertrees Road in Breckinridge County between junction with U. S. 60 and Hensley and Hardin County line. Both of these projects will be handled by State Highway Department forces.

McDade & McDade of Fulton were awarded 4.7 miles of grade and drain in Fulton County on the New Madrid Road beginning at the Kentucky-Tennessee state line and extending to the Mississippi River. The amount of the contract was $12,115.

R. H. Waters of Boston was awarded 3.1 miles of surfacing in Green County on the Greensburg-Edmonton Road for $13,276.

The Commission will handle by force account **the grading and draining of 32.9 miles** in Nelson County including 30.7 miles of U. S. Route 62 and 2.2 miles on the Boston-Lebanon Junction Road. Estimated cost is $256,647.

Ralph E. Mills Company of Frankfort bid $16,847 and was awarded the contract for timber trestle and earth approaches over Rolling Fork slough in Hardin County on the Elizabethtown-Bardstown road.

Ross Construction Company of Columbus, Ohio, was awarded 1.9 miles of grade and drain in Nelson County on Bloomfield-Springfield Road for $10,111.

States Construction Company of Louisville received award for 2.2 miles of grade and drain in Nelson County on the Boston-Lebanon Junction Road for $8,306.

Corum Brothers of Madisonville were awarded 2.4 miles of grade and drain in McLean County on the Island-South Carrollton Road for $38,124.

R. F. Pryor and Company of Mayfield were awarded grading and draining on the Mayfield-Farmington Road in Graves County for a distance of 8.8 miles to cost $65,190.

The Southeastern Construction Company of Eminence secured 2.2 miles of the Carrollton-Milton Road in Trimble County on its bid of $47,111.

Ellis, Kelly and Company of Owensboro will pave with concrete 4½ miles of the Henderson-Owensboro Road in Henderson County to cost $70,000.

Illinois Notes
By H. H. BUCHANAN

W. G. Watt, President of the **Watt Construction Co.**, Winchester, advises they are driving pile on a bridge project with their Bucyrus-Erie Type 1020 gasoline crane (½ yd. capacity) at Gale, Illinois. Wm. Stierwald is the superintendent.

Wisconsin Notes
By M. R. HUNTER

There has been practically no road work let in Wisconsin so far this year, awaiting action of the State Highway Commission and the Federal Government on the recent appropriation. It is hoped that there will be active award of contracts within the next three weeks, but it takes two weeks to advertise for bids.

Jutton-Kelley Company, Milwaukee was awarded contract on their bid of $226,921.80 option "A," and $212,115.00 option "B," for extension to dam at Prairie du Sac, 55x985, for the Wisconsin Power & Light Company at Madison.

Bids were received by the Milwaukee Sewerage Commission, City of Milwaukee, for extension to the present Sewage Disposal Plant; **G. R. Fehr, Inc.**, was low bidder at $693,041.00.

Wisconsin is in the state of hopeful waiting, as far as construction activities are concerned, other than minor small jobs, additions and repairs.

Minnesota Notes
By H. H. BUCHANAN

Lake County Road Commission, Two Harbors, is grading the Lake County portion of the Isabella-Ely Highway with its Type 1020 Bucyrus-Erie gasoline chain crowd shovel, ⅝ yd. capacity. This highway is being built through new right-of-way 18-feet wide. The excavation is cut and fill, and heavy due to the massive boulders, which the 1020 handles comparable to any shovel of 1¼ yd. size. Mr. Hanson is County Engineer in charge of this work, Albert Rafn, Superintendent, and Anselm Johnson operates the Type 1020.

Megarry Brothers, Bain, Minnesota have just completed their Minnesota State Highway project in northern Minnesota with their two Bucyrus-Erie Gas+Air dragline machines, each 1¼ yard capacity. They also rented two Northwest draglines on this work. Charles Megarry was in charge of the work and spoke highly of the excellent performance of the Gas+Air drag-

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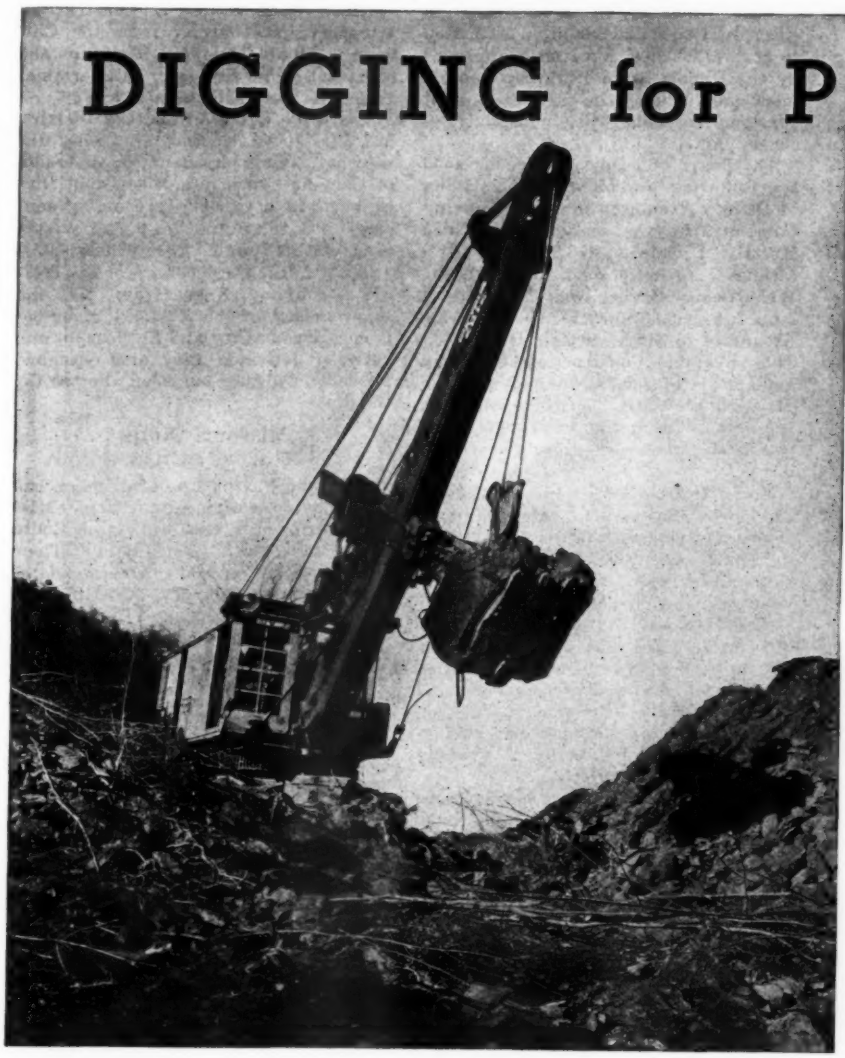

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Shots From the Firing Line— *Continued*

lines. He claimed the older of the two in one shift of 10 hours handled 2038 cubic yards, the fastest machine he ever saw.

South Dakota Notes

The above Bucyrus-Erie 43-B gasoline shovel is working on Bureau of Public Roads Project "EA" called beautiful Wind Cave National Park approach about 20 miles west of Custer, South Dakota. This machine is owned and operated by **S. J. Groves and Sons Company** of Minneapolis, and is equipped with a LeRoi RXS 6 cylinder 6½ x7 engine designed for operating between 4000 and 8000 feet altitudes.

St. Louis and Vicinity

By A. J. KOENIG

Missouri's portion of the allotment under the national recovery act totaling $400,000,000 which has been appropriated for the construction of highways amounts to $12,180,306. This money is now available for Federal Aid highways systems and extensions into and through municipalities, and for the survey, planning, improvement and construction of secondary and feeder roads as agreed upon by the State Highway Departments and the Secretary of Agriculture, represented by the Bureau of Public Roads.

Bids for the construction of the **new St. Louis Post Office** will be asked for about August 1, Klipstein and Rathman, Architects, 318 North Eighth St., St. Louis.

Major highway improvements in East St. Louis and vicinity, estimated to cost $1,000,000, have been approved by the Illinois State Highway Department and included in the program of construction under the Industrial Recovery Act.

The Board of Public Service received the following low bids for the paving of Delmar Avenue from **Central Paving Company**, for the section from Third street to Broadway, $13,889. The city's estimate for this work was $16,936. **Webb-Boone Paving** was low with a bid of $4,980.35 for the section from Broadway to Sixth; city's estimate $6,-240. **Skainka Construction Company** made a bid of $40,281 for paving from Sixth to Eleventh. This company was also low with a bid of $124,531 for paving between Jefferson and Grand Aves.

A. L. Hottman of Whiting, Kansas has three cranes, one equipped with shovel attachment that he would like to rent or lease out, or he would consider any kind of work either by the hour or sub-contract.

The Missouri State Highway Commission received bids on July 6th for 207 miles of highway surfacing divided as follows: thirty-three sections, 104 miles of gravel surfacing. Thirteen sections, 103 miles of oil mat surfacing. There was practically no grading on any of these projects.

Preliminary plans for a **reinforced concrete-steel bridge** across the Lake of the Ozarks on Highway No. 5 have been drawn. Sverdrup & Parcel, Railway Exchange Building, St. Louis, engineers.

The City of Washington, Missouri, plans the construction of a rein-concrete, steel bridge across the Missouri River.

T. O. Miles has contract for grading and drainage 0.75 mile State Aid route in Mercer county, Illinois.

Jos. Kesl & Sons have contract for curbing and concrete pavement in Collinsville, Illinois.

James M. Kurn & John G. Lonsdale, receivers for the Frisco Railroad, have been authorized to expend $495,077 for improvements, including $202,585 for culverts and trestles.

Gillen Dock Bridge & Construction Company has contract from the Chicago & Illinois Midland R. R. for the construction of river and rail terminal to handle coal shipments.

East Side Levee & Sanitary District, 628 Missouri Ave., East St. Louis, Illinois, is making plans for the diversion of Cahokia Creek into Mississippi River, north of here, also covering present creek bed through city, pumping station, etc. Estimated cost $2,000,000.

The U. S. Engineers, Postal Telegraph Building, Kansas City, plan the improvement of the Missouri River between Kansas City and St. Joseph, and between Jefferson City and Glasgow, Missouri. $464,000 has been allotted for the work.

Missouri Notes

By H. H. BUCHANAN

Atkinson Paving Co., Chillicothe, has been moving equipment to Pacific, Missouri for their paving project on Route 66 from Pacific to Gray Summit. Their Bucyrus-Erie Type 32-B gasoline clamshell crane will handle the aggregate. Upon completion they will move to Festus, on Route 61, now being graded by Len Gray, and bridges being erected by Condon, Cunningham & Lemmon.

Murray Wendle is General Manager of the Atkinson Paving Company, which has been one of the most prominent paving contracting firms in Missouri during the past five years. C. H. Atkinson originated this company many years ago at Watertown, S. D., and has long been active in paving in the Middle West. One of their first cranes was a Type "B" Bucyrus-Erie steamer, which is still operating, the traction wheel mounting replaced with caterpillar trucks several years ago, at Chillicothe.

George Lemmon, of **Condon, Cunningham & Lemmon**, bridge contractors, advises that all three of their Type 1020 Bucyrus-Erie Cranes are busy on bridge projects. One job is on Route 30 just outside of the City of St. Louis, one at Union, Missouri, and the other at Festus. Mr. Arrowsmith is superintendent of the Festus road project, on which Len Gray of St. Louis, has sub-contracted the grading, using his Gas+Air 1¼ yd. shovel.

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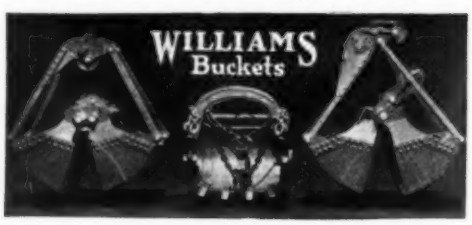

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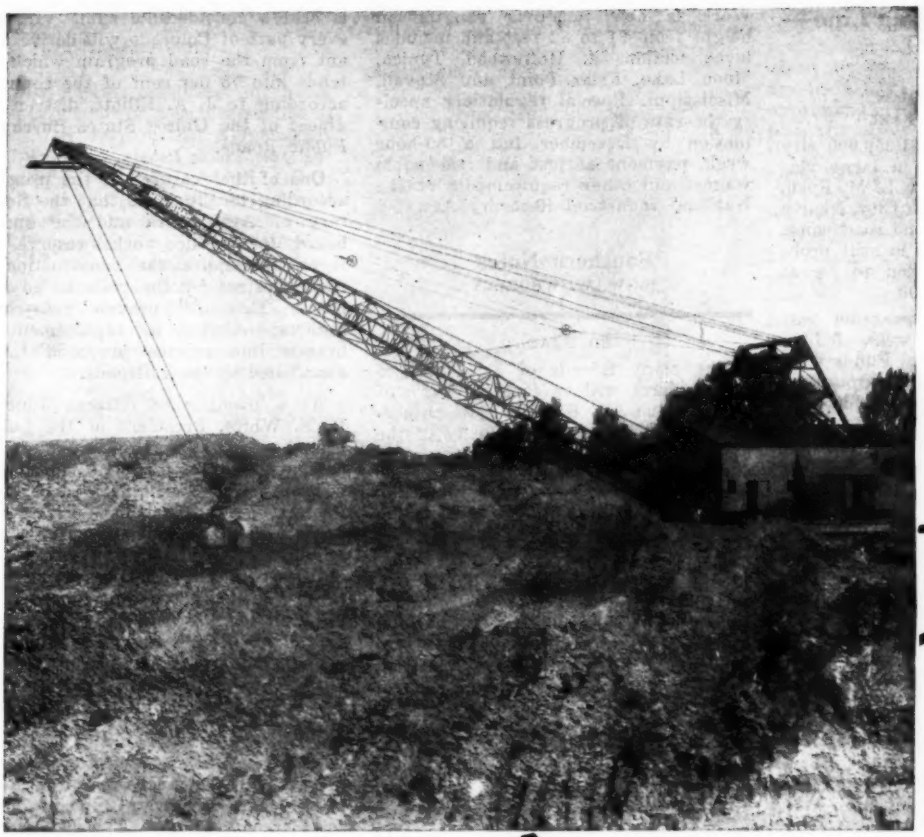

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Shots From the Firing Line— *Continued*

Oklahoma Notes

By ERNEST W. FAIR

Plans for more than $1,250,000 city improvements to include a large viaduct, have been drawn by L. M. Bush, city engineer of Oklahoma City. Nearly all plans are for street and road work. The cost of the viaduct is still problematical but is estimated to be at somewhere near $1,000,000.

Oklahoma's highway program was resumed during the last week of June when $1,153,000 in Federal Funds were used for various projects throughout the state including considerable new road building.

Bids are to be let on contracts that will include $450,000 in excavating, grading and surfacing work by the department immediately, including 7.3 miles on U. S. highway No. 60 between Pawhuska and Bartlesville, 13.5 miles on state highway No. 18 between Meeker and Chandler and 14.1 miles on state highway 35 between Woodward and Supply.

Earl A. Benson, C. E. Benson and William V. Montin of Oklahoma City have organized the **B. and M. Construction Company** of Oklahoma City. Capital stock is to be for $10,000.

JOHN W. WILLIAMS

Funeral of John W. Williams, 57, bridge contractor in Oklahoma for 12 years, who died at his home in Oklahoma City, was attended by many of his contractor friends.

River Notes

W. S. Hardwick and F. M. Horton of Beardstown, Illinois, were awarded four sections of the Chamberlain-Lobdell levee in the Second New Orleans district. The job totals 1,612,000 cubic yards and was bid at 18.6 cents per yard.

Bids will be received by the U. S. Engineers Office at Memphis on August 5th for the construction of approximately 5,843,000 cubic yards of earth work in the upper Yazoo levee district. Work is new turn-over ranging in height from 21 to 32 feet and includes levee sections at Hollywood, Tunica, Moon Lake, Friar Point and Stovall, Mississippi. Special regulations specify the rate of progress requiring completion by December 1st, a 30-hour week, payment of just and reasonable wages, and other requirements of the National Industrial Recovery Act.

Southern Notes

By W. W. WHORLEY

ED ISRAEL

The many friends of Ed Israel of Birmingham, will be sorry to learn of his death on July 6 at the Hillman hospital, Birmingham, from cancer of the stomach. Mr. Israel had been operating shovels in various parts of the country for many years and was well known. Interment was held at Jackson's Chapel in Cedartown, Georgia, his original home.

The Carrier Wrecking & Excavating Company of Detroit, Michigan, secured contract for excavation of foundation on the new post office building at Nashville, Tennessee. This work involves the removal of about 20,000 yards of material, the greater part of which is limestone rock. A Type B-2 steam shovel has been placed on the work. Under the skillful guidance of Louis Bloink and Archie Hamby who are operating opposite shifts, it is a foregoing conclusion that this job will be completed in short order.

The Volz Construction Company of Memphis has completed an important extension of the sewerage system in Shades Valley near Birmingham for Jefferson County, Alabama. This work was under the supervision of Chas. R. Volz.

Colorado Notes

By H. M. BIBAUD

Under the national industry recovery act, Colorado has been granted **$6,874,530 for road construction.** This fund is separate from the Federal aid money appropriated last year of which there is still a considerable sum. Virtually every part of Colorado will derive benefit from the road program which extends into 75 per cent of the counties, according to J. A. Elliott, district engineer of the United States Bureau of Public Roads.

One of the features of the program according to Elliott, is that the Secretary of Agriculture and the special board for public works reserve the right to require the construction of roads desired by the railroad co-ordinator. This will provide year-round highway service in replacement of branch line service proposed to be abandoned by the railroads.

At a meeting of citizens June 28 R. E. White, President of the Lamar Chamber of Commerce appointed a committee to solidify sentiment in favor of the long-sought **Caddoa Dam Project** on the Arkansas river near Lamar. The committee was to hold another meeting later with other committees to discuss the prospects of obtaining a Reconstruction Finance corporation loan to build the dam. The dam has been advocated for many years for irrigation flood control and storage purposes. It has the approval of State Engineer M. C. Hinderlider, its backers said.

Governor Ed. C. Johnson has appointed **I. F. Beauchamp** of Trinidad to the State Highway advisory board for a three year term. The district represented by Beauchamp includes Huerfano, Los Animas, Costella, Archuleta, La Plata, Dolores, San Juan, Montezuma, Pimay and San Miguel Counties.

The highway board met July 7 to prepare a budget for the expenditure of the $6,874,000 highway fund which Colorado will receive from the Federal Government under the industrial recovery appropriation. Twenty-five per cent of the money will be allocated to cities for use in connecting links in the state highway systems. Twenty-five per cent will be spent on secondary roads and fifty per cent will be used on the Federal aid roads in this state.

Proposal for a 10 million dollar dam on the Rio Grande river near the Colo-

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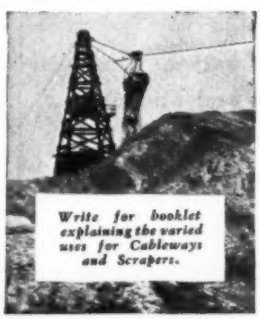

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Shots From the Firing Line— *Continued*

rado-New Mexico boundary, for many years the scheme of a vast agricultural region was revived in Albuquerque July 7 and was placed under way for its inclusion in the Federal Public works program. Officials for the local project are interested because the proposed dam would conserve certain waters of the Rio Grande which now flow off during the winter months. The movement for such a dam was first started in 1929 at the time of the signing of the Rio Grande compact between the three states, Colorado, New Mexico and Texas. A dam at the state line would impound approximately 200,000 acre feet of water. About the same amount as will be stored behind El Vado dam that is now under construction by the Middle Rio Grande Conservancy district.

A movement is under way in the Arkansas valley for inclusion in the pending public works program of a vast project to straighten the course of the Arkansas river and reclaim tracts of waste land. The river in following its course through Pueblo County carries away acres of valuable land annually. Bars divert the river causing it to eat into its banks. The plan has two principal features. The first would be the shackling the river into a deep narrow course through retaining walls. The other would be a program of silt utilization to allow the silt to spread over low areas and build up agricultural lands.

New Mexico Notes

H. E. Padgett is operating the above 50-B Bucyrus-Erie Diesel on the Rio Grande River near Belen, N. M., for the **Middle Rio Grande Conservancy District.** He tells us that he is averaging around 25 piles per 8-hour shift the quantity varying with the ground conditions. This is considered very good output under the local conditions. The pile driver leads are suspended from the boom by cable slings and a drop hammer is used. The piles are driven into the ground about 19 feet, the remainder projecting above the ground about five feet eight inches. Two cables are used to tie the piles together one approximately at the ground or water line, the other near the upper end of the pile. 48-inch fence wire is strung along the piling and also fastened to the cables. Another width of fence wire is fastened along one edge to the bottom cable and submerged in the water by means of weights. The device operates as a means to slow up the current and build a sand bar next to the fence. This type of flood protection is used to protect the riverside levees.

Walter H. Denison of Roy was awarded two jobs at the State Highway Department letting July 6th for a total of $90,263.

Arizona Notes

By H. M. BIBAUD

The Arizona Highway Commission June 20 adopted a tentative budget calling for the expenditure of $7,248,-135 for new roads during the next year after allotting $427,300 for building U. S. Highway 60. Under its action the Commission transferred $745,000 which had been set aside for oiling three sections of the Kingman Ashfork and moved to use all overages on other projects on U. S. 60 from the Salt river to Cibicue Junction. The Kingman Ashfork oiling is now under way by the forest service.

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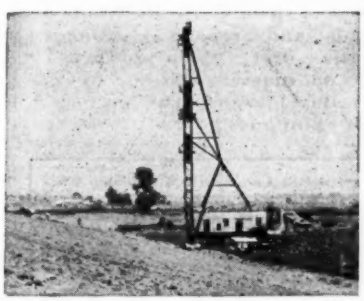

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Shots From the Firing Line— *Continued*

Senator Carl Hayden advised the Nogales Chamber of Commerce that the State Department has submitted to the public works administration complete **plans for flood control in Nogales.** This city suffers annually from flood waters from the Sonora Mountains. The State department according to Senator Hayden, had recommended that flood control work be done under the supervision of the International boundary commission. The project calls for a large conduit to be built under the principal street of Nogales to carry off the water. The big tube will swallow the waters in Mexico, carry it under the International border and under the city and empty it into a channel which connects the Santa Cruz river north of Nogales and will provide employment for about 300 men for about a year. Cost of the project is estimated at $135,000.

Final recapitulation of the **Arizona Highway department budget** for the ensuing fiscal year disclosed the fact that $743,550 would be spent on U. S. Highway 60 between Globe and Showlow. Other allotments include U. S. Highway 80, $831,300; U. S. Highway 89, $1,512,000; U. S. Highway 60 in Yuma and Yavapai counties $711,900; U. S. Highway 66, $1,312,000.

More than $10,000,000 was the latest figure for **Highway construction in Arizona** according to a telegram received July 13 from Senator Carl Hayden in a telegram to State Engineer T. S. O'Connell. This increases the road fund by about $5,000,000, the latter sum to be spent chiefly on forest highways and trails, natural parks, highways and roads through public lands. About 5000 men will be employed on the projects, calls and bids for these having been already included in the schedule.

A $10,000,000 loan to develop **600,000 acres in the Parker Indian Reservation** in western Yuma County will be added to the Public works administration, the Arizona Colorado River Commission announced July 14. The proposed project will be the largest of its kind in the world, it is said. Water for irrigation will be pumped from a diversion dam below Boulder Dam to the plateau on which the land is located. The old question of the Colorado river division arose but it was pointed out under the Swing-Johnson bill Arizona is to receive 4,400,000 acre feet, 2,200,000 acre feet more than under the Wilbur agreement formerly in effect. The commission met in Prescott July 14 with Governor B. B. Moer.

Nevada Notes

By H. L. LIVINGSTON

The tentative **Nevada State Highway construction program** for 1933, as announced by the Highway Commission at Carson City, involves a total of $3,400,000. The grading, paving, surfacing and oiling projects are: Churchill County—12.15 miles reconstruction and graveling, Leeteville to Lahontan $42,000 4.98 miles reconstruction, Fallon to 5 miles south $100,000, 8 miles reconstruction, Eastgate to Carroll Summit $40,000; Clark County—8.30 miles reconstruction and graveling, Las Vegas to 6 miles Sw. Apex $50,000, 8.41 miles reconstruction, Dry Lake to Crystal $45,000, 22.33 miles new graveling, Las Vegas to 22 miles north $90,000, 18.83 miles new graveling, 22 miles north of Las Vegas to Indian Springs $75,000, 11.91 miles reconstruction, Bard to Las Vegas $70,000; Elko County — 1.21 miles concrete paving in City of Elko $54,500; Eureka County—10.18 miles reconstruction and graveling, Eureka to Eureka W. P. Co. Line $66,000, 18.72 miles reconstruction and graveling 27 miles east of Austin to 14 miles W. Ray Rch. $75,000; Humboldt County—30.13 miles new graveling, Orovada to Idaho State Line $150,000; Landers County—14.73 miles reconstruction and graveling 12 miles east of Austin to 27 miles E. Austin $103,000, 15.92 miles reconstruction and graveling, Campbell Creek to Railroad Pass $64,000, 10.95 miles oiling Austin to 12 miles east $33,000; Lincoln County — 12.47 miles new graveling Maynard Lake to 2 miles south of Alamo $143,000, 13.50 miles reconstruction, Pioche to Stonehouse $54,000, 40 miles new graveling 2 miles south of Alamo to 14 miles west Caliente $200,000; Lyon County—0.98 miles new graveling Hoye to County Line $20,000, 12.95 miles oiling 2 miles East Mound House to 9 miles east of Dayton $32,500, 9.99 miles oiling 12 miles west to 2 miles west Lahontan $25,000, 2.75 miles reconstruction, Wilson to Bulkhead $68,000; Mineral County 28.50 miles oiling, Rhodes to 12.8 miles east of Hawthorne $84,000, 21.8 miles new graveling, Coaldale to Basalt $150,000, 21.9 miles new graveling, Tonopah Junction to Basalt $150,000, 12.65 miles new graveling, Basalt to California State Line $125,000, 22.22 miles oiling Schurz to Dutch Creek $66,000; Nye County 10.92 miles reconstruction and oiling, 33 miles S. Beatty to 22 miles S. Beatty $76,000, 20.21 miles new graveling, 22 miles S. Beatty to 2 miles S. Beatty $81,000; Washoe County—26.97 miles reconstruction, Vista to Wadsworth $540,000.

Bridge construction projects include: Elko County—bridge and 0.04 miles approaches Silver Zone Overpass $15,000, overhead crossing over Western Pacific at Deeth $40,000, overhead crossing over Southern Pacific at Wells $25,000, overhead crossing over Western Pacific at Wendover $20,000; Eureka County—overhead crossing over Western Pacific at Dunphy.

Shots From the Firing Line
Continued on page 336

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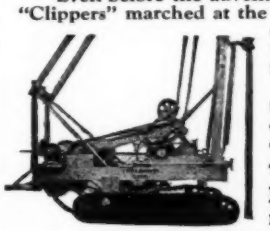

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Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco
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EXCAVATING ENGINEER Bargain Counter

★ ★ ★ **AS ADDITIONAL SERVICE to the industry of excavation, Excavating Engineer lists below a large number of equipment bargains available at the present time. Some of this equipment is new, some has been rebuilt by the manufacturer and some is just plain used. We believe that each item represents a bargain for the man who has use for that particular type of equipment. Send us a postal card or letter, giving reference number and we will pass the inquiry right on to the owner.** ***Address all inquiries to Bargain Counter,*** **Excavating Engineer, South Milwaukee, Wisconsin.** ***Good Values—Very Low Prices***

SHOVELS-CRANES DRAGLINES

P&H MODEL 208—45′ BOOM DRAGLINE Cats—15½′ long, 9′ wide, 22″ Treads. 100 HP. Waukesha High Alt. Engine. SCD-1.

BUCYRUS-ERIE REBUILT TYPE B HIGH LIFT STEAM SHOVEL. Excellent condition. Clamshell equipment available. SCD-2.

AMERICAN 1 CU. YD. GASOLINE SHOVEL. Motor overhauled 1932. Good value. SCD-3.

P&H MODEL 600—40′ BOOM CLAMSHELL. Waukesha 75 HP. Engine. New 1929. Dragline and Shovel equipment also available. SCD-4.

ORTON ⅝ YD. GASOLINE SHOVEL. New 1928. Make an offer. SCD-5.

BUCYRUS-ERIE TYPE B-2 HIGH LIFT STEAM SHOVEL. Cat Mounting. Excellent condition. Very low price. SCD-6.

P&H MODEL 600. New 1929. 20′ Boom, 14′3″ Dipper Handle, 1 cu. yd. Dipper. Waukesha 75 HP. Engine. Dragline and Clam Shell Equipment also available. SCD-7.

BUCYRUS-ERIE MODEL 30-B DIESEL—25′9″ Boom, 14′ Dipper Handle, 1 yd. Dipper. SCD-9.

BAY CITY TRACTOR TYPE—CHAIN CROWD—⅜ YD. SHOVEL. Cat Mounted. McCormick-Deering Power Unit. Excellent condition. SCD-10.

OSGOOD "CONQUEROR" GAS—1¼ CU. YD. SHOVEL—Brand New LeRoi Engine. Clamshell Equipment also available. SCD-18

MONIGHAN MODEL 1-W, WALKER—60′ Boom Dragline, 1¼ cu. yd. Page Bucket. Good condition. SCD-13.

P&H MODEL 600—40′ BOOM DRAGLINE. Waukesha 75 HP. Engine. New 1929. Shovel and Clamshell Equipment also available. SCD-14.

BAY CITY TRACTOR TYPE CLAMSHELL. NEW 1928. Excellent condition. Shovel Equipment also available. SCD-15.

BUCYRUS-ERIE SLIGHTLY USED-LOAD-MASTER TRACTOR CRANE—14′ Boom—Rubber tired wheels—Rated lifting capacity 4500 lbs. McCormick-Deering Power Unit—New Machine Guarantee. SCD-17

OSGOOD "CONQUEROR" GAS—40′ BOOM CLAMSHELL—Brand New LeRoi Engine. 1¼ cu. yd. Shovel Equipment also available. SCD-19

CAT MOUNTINGS

Give that Old Wheel Machine New Life

1 REBUILT SPUR GEAR CAT MOUNTING—Interchangeable with Type B or Type B-2 Bucyrus-Erie traction wheel or cat mounting. CM-1.

BOILERS

BRAND NEW

Will Make That Old Shovel Work Like New.

Can Also Be Used for Miscellaneous Service.

Vertical Type

9 36″x82½″—26 H.P.—142 lb. Working Pressure. Mass. Std. Will fit Type A. B-1.

4 42″x88″—35 H.P.—144 lb. Working Pressure. Mass. Std. Will fit Type B Shovel. B-2.

1 44½″x88½″ fitted with extended fire box for burning wood. Can be used for coal or coke. 37 H.P.—144 lb. Working Pressure. ASME Std. Can be installed on Type B Shovel. B-3.

1 44½″x88½″—37 H.P.—145 lb. Working Pressure. Canadian Std. Will fit Type B Machine. B-4.

2 44½″x88½″—37 H.P.—147 lb. Working Pressure. Mass. Std. Will fit any Type B B-5.

1 46½″x88½″—37 H.P. 150 lb. Working Pressure. Special Wood Burning. Mass. Std. Will fit any B-2 or B-3 Machine. B-7.

2 46½″x88½″—37 H.P.—150 lb. Working Pressure. Mass. Std. Will fit B-2 or B-3 B-8.

3 46½″x110″—40 H.P.—155 lb. Working Pressure. Special Wood Burning Fire Box. ASME Std. Will fit any B-2 or B-3 B-9.

1 48″x7′10″—52 H.P.—150 lb. Working Pressure. Mass. Std. Will fit any 31-B B-10.

1 54″x100″—41 H.P.—125 lb. Working Pressure. ASME Std. Will fit B-2 or B-3. B-11.

2 58″x7′9″—70 H.P.—150 lb. Working Pressure. Mass. Std. Will fit 42-B Machine. B-12.

Locomotive Type

3 44″x17′—75 H.P.—125 lb. Working Pressure. ASME Std. Will fit Model 68-C. B-13.

1 44″x18′—88 H.P.—125 lb. Working Pressure. ASME Std. Will fit Model 70-C B-14.

1 54″x9′7″—70 H.P.—125 lb. Working Pressure. Canadian Std. Will fit Model 50-B Machine. B-15.

2 54″x11′3″—92 H.P.—125 lb. Working Pressure. ASME and Mass. Std. Will fit Model 50-B Machine. B-16.

1 54″x18′—127 H.P.—140 lb. Working Pressure. ASME Std. Will fit Model 103-C B-17.

AIR COMPRESSORS

2 11″x11″x12″ STEAM DRIVEN LOCOMOTIVE TYPE, Westinghouse air compressors with fittings. Brand New. AC-1.

2 11″x11″x12″ STEAM DRIVEN LOCOMOTIVE TYPE, Westinghouse air compressors with fittings. Used. Make offer. AC-2.

ENGINES

Designed especially for application to Excavating or similar Equipment. Can be used for stationary or semi-stationary service.

Diesel

11 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—4-cylinder, 7″ bore x 8½″ stroke, 75 HP at 600 RPM, 4 cycle, Vertical—valve in head type. Includes radiator, fan, auxiliary air compressor, tank and fittings, fuel tank with pipe and fittings. Also mounted on structural base for portable use. DE-1.

2 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—8-cylinder, 9″ bore x 10½″ stroke, 150 HP at 450 RPM, 4 cycle, Vertical—valve in head type. Dust proof, Oil tight crank case and forced lubricating system. Full equipment. Also auxiliary air starting equipment. DE-2.

1 SLIGHTLY USED NON-REVERSIBLE ATLAS DIESEL ENGINE—3-cylinder, 6½″ bore x 8½″ stroke, 45 HP at 600 RPM, 4 cycle, Vertical—valve in head type, Dust proof. Enclosed oil tight crank case and forced lubricating system. Excellent operating condition. Will demonstrate. DE-3

1 REBUILT-BRAND NEW CYLINDERS—120 HP 14″x17″ TWO CYLINDER FAIRBANKS-MORSE-DIESEL ENGINE, SPEED 257 R.P.M.—Fuel Tank, Air Tank, Water circulating Pump, Four cylinder starting Engine belted to Compressor and Hand Pump for filling fuel tank included. DE-4.

4 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—3-cylinder, 6″ bore x 8″ stroke, 45 HP. at 650 RPM. DE-5

3 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—4-cylinder, 6″ bore x 8″ stroke, 60 HP. at 650 RPM. DE-6

Steam

1 12½″x16″ link reversing type for Railroad Shovel. ME-1.

2 4½″x5″ reversible—20.8 HP at 400 RPM. 100 lb. Pressure. ME-2.

1 4¾″x5″ reversible—23.2 HP at 400 RPM. 100 lb. Pressure. ME-3.

2 5″x5″ reversible—25.6 HP at 400 RPM. 100 lb. Pressure. ME-4.

1 "LITTLE TUGGER" INGERSOLL RAND STEAM HOIST ENGINE No. 1-H-5-2½ H.P. ME-5.

COMPLETE FRONT END EQUIPMENT

Shovel Equipment

½ CU. YD. DIPPER—20' BOOM—13' DIPPER HANDLE—Rope Crowd Shovel Equipment suitable for Model 1020. **Brand New.** SE-7.

⅝ CU. YD. DIPPER—22' BOOM—15' DIPPER HANDLE—Extra High Lift Rope Crowd Shovel Equipment suitable for Model 21-B. Brand New. SE-21

¾ CU. YD. DIPPER—23' BOOM—15' DIPPER HANDLE—Extra High Lift Rope Crowd Shovel Equipment suitable for Models 1030 or 1035. **Brand New.** SE-2.

¾ CU. YD. DIPPER—20'6" BOOM—14' DIPPER HANDLE—Rope Crowd Shovel Equipment suitable for Model 21-B. **Brand New.** SE-8.

¾ CU. YD. DIPPER—23' BOOM and ENGINE—12'6" DIPPER HANDLE—Shovel Equipment suitable for 20-B Steam. **Brand New.** SE-15.

¾ CU. YD. DIPPER—26' BOOM and ENGINE—17' DIPPER HANDLE—High Lift Shovel Equipment suitable for 30-B Steam. Brand New. SE-16.

¾ CU. YD. DIPPER—25'9" BOOM—14' DIPPER HANDLE—Shovel Equipment suitable for 30-B Diesel. **Brand New.** SE-17.

⅞ CU. YD. DIPPER—23' BOOM—15' DIPPER HANDLE—High Lift Rope Crowd Shovel Equipment Complete suitable for Model 1030 or 1035. Rebuilt—New Equipment Guarantee. SE-22

⅞ CU. YD. DIPPER—21'9" BOOM and ENGINE—15' DIPPER HANDLE—High Lift Shovel Equipment. Suitable for 31-B Steam. **Brand New.** SE-18.

⅞ CU. YD. DIPPER—24' BOOM—16' DIPPER HANDLE—Rope Crowd Shovel Equipment suitable for Model 32-B. **Brand New.** SE-9.

1 CU. YD. DIPPER—26' BOOM—15' DIPPER HANDLE—Rope Crowd Shovel Equipment suitable for Model D-2. **Brand New.** SE-3.

1¼ CU. YD. DIPPER—25' BOOM—17' DIPPER HANDLE—Slightly Used Rope Crowd High Lift Shovel Equipment suitable for Model 37-B. **New Machine Guarantee.** SE-5.

1⅛ CU. YD. DIPPER—23'6" BOOM—15' DIPPER HANDLE—Slightly Used Rope Crowd Shovel Equipment suitable for Model 37-B. **New Machine Guarantee.** SE-6.

1½ CU. YD. DIPPER—27' BOOM—17' DIPPER HANDLE—High Lift Rope Crowd Shovel Equipment suitable for Model 43-B. **Brand New.** SE-12.

1½ CU. YD. DIPPER—30' BOOM and ENGINE—19' DIPPER HANDLE—High Lift Shovel Equipment suitable for 50-B Steam. Brand New. SE-19.

1¾ CU. YD. DIPPER—24' BOOM—15' DIPPER HANDLE—Rope Crowd Shovel Equipment suitable for Model 43-B. **Brand New.** SE-13.

1¾ CU. YD. DIPPER—32'6" BOOM—17'6" DIPPER HANDLE—High Lift Rope Crowd Shovel Equipment suitable for 50-B Diesel. **Brand New.** SE-20.

BRAND NEW Ropes included with each of above Shovel Equipments.

Clamshell Equipment

30' BOOM COMPLETE EQUIPMENT INCLUDING ROPES. Suitable for Models 1020 or 1025. **Brand New.** CS-1.

35' BOOM COMPLETE EQUIPMENT INCLUDING ROPES. Suitable for Models 1020, 1025 or 21-B. **Brand New.** CS-2.

40' BOX BOOM CLAMSHELL EQUIPMENT INCLUDING ROPES. Suitable for Model D-2. **Brand New.** CS-3.

Lifting Crane Equipment

35' BOOM AND ROPES, and 10 ton Dobie Block. Suitable for Models 1020 or 1025. **Brand New.** LC-1.

30' BOOM AND ROPES, including one 10 ton Dobie Block. Suitable for Models 1020, 1025 or 21B. **Brand New.** LC-2.

Dragline Equipment

35' BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Models 1020, 1025 and 21B. DL-1.

35' CHANNEL BOOM, FAIRLEAD AND ROPES but not including bucket. For use on Model D-2. DL-2.

40' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Model D-2. DL-3.

40' BOX BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Model D-2. DL-4.

45' BOX BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Model D-2. DL-5.

40' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model E-2. **Brand New.** DL-6.

45' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model E-2. **Brand New.** DL-7.

40' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model 30-B Diesel. **Brand New.** DL-8.

45' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model 30-B Diesel. **Brand New.** DL-9.

BRAND NEW Ropes included with each of above Dragline Equipments.

All of above equipment is BRAND NEW and of BUCYRUS-ERIE manufacture.

Trench Digging Equipment

½ CU. YD.—30" WIDE SOLID TYPE DIPPER, 18' Boom, Dipper Handle and all auxiliary equipment for application to **Model 1020.** Will dig to maximum depth of 16'. DS-1.

¾ CU. YD.—36" WIDE SOLID TYPE DIPPER, 18' Boom, Dipper Handle and all auxiliary equipment for application to **21-B.** Will dig to maximum depth of 16'. DS-2.

¾ CU. YD.—36" WIDE SOLID TYPE DIPPER, 21' Boom, and all auxiliary equipment for application to **Model 1030.** Will dig to maximum depth of 18'. DS-3.

1 CU. YD.—42½" WIDE SOLID TYPE DIPPER, 21' Boom, and all auxiliary equipment for application to **Model 32-B.** Will dig to maximum depth of 18'. DS-4.

1 CU. YD.—42½" WIDE SOLID TYPE DIPPER, 24' Boom, and all auxiliary equipment for application to **GA-2 Shovel.** Will dig to maximum depth of 22'. DS-5.

1 CU. YD.—42½" WIDE SOLID TYPE DIPPER, 24' Boom, and all auxiliary equipment for application to GA--2 CLAMSHELL OR DRAGLINE. Will dig to maximum depth of 22'. DS-8.

1 CU. YD.—42½" WIDE SOLID TYPE DIPPER, 24' Boom, and all necessary auxiliary equipment for application to GA-3 SHOVEL. Will dig to maximum depth of 22'. DS-6.

1 CU. YD.—42½" WIDE SOLID TYPE DIPPER, 24' Boom, and all auxiliary equipment for application to GA-3 CLAMSHELL OR DRAGLINE. Will dig to maximum depth of 22'. DS-9.

All of the above equipment is BRAND NEW and of Bucyrus-Erie manufacture.

BRAND NEW PAGE, two dippers each ¾ cu. yd., one 38" wide over cutters, the other 49½" wide over cutters. 17'1½" Boom and all necessary auxiliary equipment. Will fit Bucyrus-Erie 1030, 1035 or 32-B. DS-7.

BRAND NEW Ropes included with each of above Trench Digging Equipments.

Dippers—Small Machines

2 ⅝ CU. YD.—Plate.—Will fit 20-B Steam or Gas. Brand New. D-12

1 2/3 CU. YD.—Plate front.—Will fit 14-B. Brand New. D-13

1 ¾ CU. YD.—Rock type.—Will fit 30-B Gas or Diesel. Brand New. D-14

1 ¾ CU. YD.—Rock Type.—Will fit 20-B Steam or Gas. Brand New. D-15

4 ¾ CU. YD.—Plate front.—Will fit 1030 or 1035. Brand New. D-16

1 ¾ CU. YD.—Cast Front Inserted Tooth. Will fit 1030 or 1035. Brand New. D-17

2 ⅞ CU. YD.—Plate front.—Will fit 1030 or 1035. Brand New. D-18

2 ⅞ CU. YD.—Cast Front Inserted Tooth. Will fit B-B2-B3-GA2-GA3. Brand New. D-19

1 ⅞ CU. YD.—Plate Front. Will fit 18-B. Brand New. D-20

1 ⅞ CU. YD.—Rock type. Will fit 31-B. Brand New. D-21

1 1 CU. YD.—Rock type. Will fit D-2 or 31-B. Slightly Used. D-22

1 1 CU. YD.—Cast front inserted tooth. Will fit 41-B or 42-B Steam or Electric. Brand New. D-23

1 1 CU. YD.—Cast Front Inserted Tooth. Will fit GA-2 or GA-3. Brand New. D-24

2 1¼ CU. YD.—Cast Front Inserted Tooth. Will fit GA-2 or GA-3. Brand New. D-25

1 1¼ CU. YD.—Plate front. Will fit E-2, 41B or 42-B. Slightly Used. D-26

2 1¼ CU. YD.—Plate Front. Will fit E-2, 41-B or 42-B. Brand New. D-27

1 1½ CU. YD.—Plate. Will fit E-2, 41-B, 42-B. Brand New. D-28

2 1½ CU. YD.—Manganese Front Inserted Tooth. Will fit E-2, 41-B or 42-B. Slightly Used. D-29

1 1½ CU. YD.—Vanderhoef type with Vanderhoef teeth. Will fit E-2 or 42-B. Slightly Used. D-30

Dippers—Large Machines

1 1½ CU. YD.—Manganese Steel Front—Van Port teeth. Will fit 50-B or 52-B Diesel. Brand New. D-31

1 1¾ CU. YD.—Plate front. Will fit 50-B. Brand New. D-32

1 2¼ CU. YD.—Plate front, coal loading type. Will fit 50-B. Brand New. D-33

1 2½ CU. YD.—Front 2½" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Can be used on Model 75-B, 68-C, 70-C Machines. **Brand New.** D-1.

2 3 CU. YD.—Front 2½" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Can be used on Model 100-B, 68-C, 70-C Machines. **Brand New.** D-2.

1 3½ CU. YD.—Front 2¾" Nickel Chrome Steel, two part Van Port Reversible Teeth. Can be used on Model 88-C, 95-C, Class 180. **Brand New.** D-3.

1 4 CU. YD.—Front 2¾" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Has seen some service but in good condition. Can be used on Model 100-C, 120-B. D-4.

1 4½ CU. YD.—Lip 2¼" Manganese Steel, two part Reversible Manganese Teeth. Can be used on Model 88-C, 110-C. **Brand New.** D-5.

3 6 CU. YD. Molybdenum Steel Front, Annealed Cast Steel Back, two part Reversible Van Port Teeth. Can be used on 225-B and 320-B. **Brand New.** D-11.

1 8 CU. YD.—Front Molybdenum Steel, two part Van Port Reversible Teeth. Can be used on Model 320-B. **Slightly Used** but excellent condition. D-6.

Dragline Buckets

1 1¾ CU. YD. OMAHA STANDARD. Rebuilt. DB-7.

1 2 CU. YD. BUCYRUS-ERIE TYPE "U" RED ARCH. Rebuilt. DB-6.

1 2 CU. YD. BUCYRUS-ERIE TYPE "U" RED ARCH. Rebuilt. DB-8.

1 2½ CU. YD. BUCYRUS-ERIE INSERTED TOOTH. Rebuilt. DB-9.

1 2½ CU. YD. OMAHA STANDARD. Rebuilt. DB-10.

ELECTRICAL EQUIPMENT

MOTOR—GENERAL ELECTRIC—3 phase, 25 cycle, 550 volt, 1500 RPM., 90 HP., BRAND NEW. EE-1.

50 KW MOTOR-GENERATOR SET—GENERAL ELECTRIC—consisting of 3 phase, 60 cycle, 440 volt, 1170 RPM., 75 HP., Induction Motor connected to 50 KW, 250 volt, 1200 RPM., Generator, including suitable rheostat and compensator. BRAND NEW. EE-2.

COMPENSATOR—GENERAL ELECTRIC—75 HP., 2200 volt, 3 phase, 25 cycle, manual type. BRAND NEW. EE-3.

TRANSFORMER—GENERAL ELECTRIC—5-KVA. 2200-3810 volt primary, 440-220 volt secondary—3 phase, 60 cycle, with cast iron tank and cover, including specially fastened bushings to prevent oil leakage. BRAND NEW. EE-4.

GENERATOR—WESTINGHOUSE—125 KW, 250 volts, 500 amperes. Direct Current. 440 RPM. Includes two outboard bearings. BRAND NEW. EE-5.

MOTORS (2)—GENERAL ELECTRIC—21.5 H.P. 3 phase, 60 cycle, 440 volt, 900 RPM. Totally enclosed—ball bearing. BRAND NEW. EE-6.

LIGHTING PLANTS

1 1 KW MOON TURBO STEAM GENERATOR for Lighting Plant. 32 Volt. New. LP-1.

1 1 KW MOON TURBO STEAM GENERATOR for lighting Plant. 110 Volt. New. LP-2.

1 1 KW MOON TURBO STEAM GENERATOR for Lighting Plant. 110 Volt. Used. LP-3.

Shots From the Firing Line— *Continued*

California Notes

Gist and Bell, Arcadia, are operating their Bucyrus-Erie 43-B gasoline shovel near Big Meadow on a section of the Generals Highway, the road now being constructed to connect the General Sherman tree in Sequoia National Park with the General Grant tree in General Grant National Park. The General Sherman tree is the largest Redwood in California. This highway, a most important link in the Sierra National Parks Highway network, will extend from Isabella in Kern County to Yosemite Valley—a distance of 316 miles.

Pacific Coast Notes

By H. L. LIVINGSTON

The Metropolitan Water District of Los Angeles has signed contracts and awarded same to the **Walsh Construction Company** for the following tunnels: 1.07 miles Colorado River, 2.34 miles Copper Basin Tunnels 1 and 2 and 6.09 miles Whipple Mountain Tunnels. The amount of this contract is $4,357,780.

The United States Engineer's Office, 401 Custom House, San Francisco, will call for bids shortly for widening and deepening the channel from Mare Island Straits to Silent Slough and from Silent Slough to Napa City by dredging to eight feet deep and one hundred feet wide. This work will involve approximately 100,000 cubic yards of dredging.

The following contracts have been awarded by the **Metropolitan Water District** for a portion of the Colorado River Aqueduct.

To **L. E. Dixon Company & Brent Brothers** of Los Angeles for the West Portion of the West Eagle Mountain Tunnel 2.01 miles long at $1,025,898.

To **J. N. Gordon & Floyd Shofner** of Los Angeles the Hayfield No. 2 Tunnel 1.02 miles long at $471,889.

To **Broderick & Gordon**, Denver, the East Portion of the West Eagle Mountain Tunnel 2.97 miles long at $1,435,-614.

To **Hunkin - Conkey Construction Company** of Cleveland, Ohio, the entire Hayfield No. 1 Tunnel 1.82 miles long at $814,952.

To **Morrison-Knudsen Company** of Los Angeles the Mecca Pass Tunnels No. 1, 2 and 3, 1.11 miles long at $575,-685.

R. M. Merriman has been appointed Division Superintendent and will be in active charge of the Coachella tunnel work for the Metropolitan Water District. He has been General Superintendent for the Dravo Contracting Company on the Valverde Tunnel.

FRED WORTHEN BRADLEY

We announce with regret the death on July 6 of Fred Worthen Bradley, internationally known mining expert and engineer at Alta, Placer County, California. Mr. Bradley was President of the Alaska-Juneau Gold Mining Company and many other large mining concerns.

Oregon Notes

By MARC D. TROYER

On the Willamette Highway at Crescent Lake, **Kern & Kibbe** have their Bucyrus-Erie 43-B shovel in some extremely hard digging. The accompanying illustration shows the machine working at an altitude of 4,000 feet.

They are also operating two Caterpillar "60's," two "30's" with scrapers and blades and drums for the chunk out work, four "70" Diesels with 9-yard LaTourneau scrapers, and one Cletrac "80" with an Ogden 10-foot blade. Tom Anderson is running the shovel and Wade Goodman, Allis-Chalmers representative, is shown in the background. Mr. Archibald is General Superintendent and Mr. Otto Hartman is Assistant Superintendent on the job.

J. A. Terteling and Sons were recently awarded an additional contract at Nyssa, Oregon, on which they are about to start work with their Bucyrus-Erie 52-B dragline. This is a continuance of the irrigation ditch on which they previously used this machine.

An Englishman, while attending a banquet in Canada, was very much impressed by the following toast: "Here's to the happiest moments of my life when I was held in the arms of another man's wife—my Mother."

The Englishman upon returning to England, was elected toastmaster at a banquet and decided to give the clever toast he had heard in Canada. He rose and said: " 'Ere's to the 'appiest moments of my life, when I was 'eld in the arms of another mans' wife—er, er—ah, I forgot who the bally woman was.' "

POSITIONS WANTED

Positions wanted advertisements will be run under this heading for 5 cents per word, minimum charge $1.00. Advertisements for help wanted free of charge.

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

TRANSITMAN — OFFICE WORK

Experienced transitman with mining experience desires transit work, or will work as rodman, chainman or engineer's helper. Have also had experience as timekeeper, and much experience in safety work. Good references. Located Wisconsin, will go anywhere. Box 3513.

STUDENT WANTS SUMMER WORK

College civil engineering student living in Milwaukee, Wisconsin desires practical summer work with small pay on some small job, such as waterboy, flagman, rodman or stake boy for surveying, timekeeper, clerk, etc. in construction or open pit mining operation. Can furnish references. Box 5502.

DRAGLINE OPERATOR

25 years experience on steam draglines on construction work. Prefer operating dragline. Can do own repair work. Reliable references furnished. Present location, Indiana. Box 5701.

SHOVEL OPERATOR

Three years' experience on Bucyrus-Erie Gas + Air on basement excavating, highway and street grading. Also eight years' experience on Erie, Marion, Bucyrus, steam shovels. Will go anywhere in U. S. A. or Canada. Can do own repairing. A-1 reference. Married. Present location Minnesota. Box 5801.

SHOVEL OPERATOR

Have operated steam, electric and gasoline shovels of practically every make for 20 years on highway and railroad grading, drainage and irrigation and in rock quarry. Can do own repair work and furnish excellent references. Age 45 and married. Willing to go anywhere. Present location New York State. Box 5704.

DRAGLINE OPERATORS WANTED

Single men for positions in Central and South America. Only those with experience in operating Diesel powered draglines need apply. Write fully, stating age and Diesel dragline experience to: United Fruit Company, One Federal Street, Boston, Mass. (Employment Dept.)

SHOVEL OPERATOR

14 years' experience on Bucyrus-Erie, Marion, Thew and Osgood shovels, steam and Gas + Air powered. Experienced in all kinds of shovel work—canal, quarry, railroad, street and highway. Can produce A-1 yardage and do own repair work. Reliable references furnished. Will go anywhere in U.S. on short notice. Present location Ohio. Box 5706.

WANTED

Position as crane, dragline or shovel operator, gas or steam. Have engineer's License and have operated since 1907. Can operate practically all types. Can furnish excellent references. Present location Texas. Box 5705.

MEN WANTED

The United States Civil Service Commission will hold competitive examinations for a Senior Highway Construction Supervisor and a Senior Highway Design Engineer in the Bureau of Roads. Entrance salaries are from $4600 to $5400 a year less 15 percent economy deduction and a retirement deduction of 3½ percent. Applications must be filed with the Civil Service Department at Washington no later than July 14th. Competitors will not be required to complete a written examination but will be rated on education and experience. Full information can be obtained from the local secretaries of the U. S. Civil Service Examiners or from the U. S. Civil Service Commission at Washington.

DRAGLINE-SHOVEL OPERATOR

10 years' experience on Bucyrus-Erie, Link Belt, Marion and Northwest machines, steam, gasoline and Diesel powered. Have worked on highway and railroad grading, quarry excavation and drainage irrigation. Willing to go anywhere in U. S. A. Also have 2 years' machine shop experience. Can do own repairing and furnish A-1 references. Present location Florida. Box 5702.

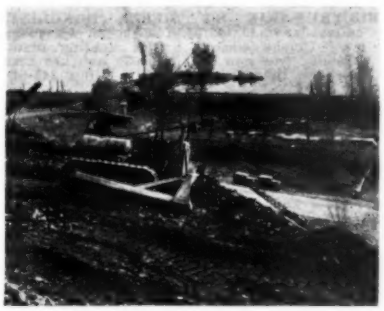
Building the South Jetty on the COLUMBIA

(Continued from Page 312)

struction, the dumped rock thus providing support for the piling.

Flats unloaded with small Bucyrus-Erie steamers

The method of unloading cars was of unusual interest, two 1-yard Bucyrus-Erie steamers being assigned to this task. The loaded cars were taken out over the trestle by the switch engines in twenty trains and to each of these was attached a flat car carrying one of the steamers. When the proper location was reached the shovel would move out over the top of the cars and nose the rocks over the edge to fall 20 or 30 feet under the sea from the tramway.



Caterpillar tractors and LeTourneau bulldozers helped grade for the railroad connection.

Considering that many of the rocks weighed up to 25 and 33 tons, which is close to the total weight of the shovel itself, putting some of these big boys overboard was a tough job. But over they went, nevertheless and as many as 45 carloads were distributed in an eight hour shift.

This interesting project which was started in late February last year was completed in December, 1932.

The officers of the Columbia Contract Company responsible for the well organized methods used in piling up the 700,000 tons of rock required for the jetty are: the late Daniel Kern, President; C. F. Adams, Secretary; Louis H. Mills, Vice-President; Glen E. Kibbe, General Manager; A. D. Kern, Assistant to the President; R. A. Lathrop, Superintendent of Quarry, Otto Hartman, jetty superintendent.

Excellent results were obtained in drilling and blasting as is evidenced by this bank ahead of one of the cranes. Compare the size of the rock pieces with the man operating a jack hammer in the lower right hand corner of the picture.

FOR SALE

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Small Shovels
Under 2 Yards

BUCYRUS-ERIE TYPE "GA-2" GAS+AIR SHOVEL, shop number 4117, mounted on spur gear drive caterpillar trucks, and equipped with a 24-foot boom; 18-foot, 4-inch dipper handle; 1-cubic-yard manganese cast front socket inserted tooth dipper; power boom hoist; air self-starter, and all equipment and appurtenances in accordance with the specifications of Bucyrus-Erie Company, f.o.b. cars shipping point Virginia. Box 126-SS.

MARION MODEL 21 COMBINATION HIGH LIFT STEAM SHOVEL, ¾-cubic-yard manganese steel dipper, 15-foot dipper handle, 20-foot shovel boom. Also includes 40-foot boom crane equipment including two drums. Boiler retubed and machine is in excellent operating condition. Location about 15 miles from Baltimore, Maryland. Price for immediate acceptance, subject to prior sale, f.o.b. present location—$1,800. Box 396-SS.

P. & H. MODEL 206 Gasoline Combination Shovel and Clamshell machine. Good condition. Located vicinity Chicago. Box 336-SS.

20-B BUCYRUS-ERIE STEAM SHOVEL, serial number 4000; caterpillar mounted; 18-foot boom, 12-foot 6-inch dipper handle, 1-yard dipper; shipped new in 1923; located western Missouri. Bargain. Box 241-SS.

THEW "O" ¾-cubic-yard gas shovel rebuilt 1931 and mounted on new center drive "cat". Box 343-SS.

CHEAP!

Two 20-B Bucyrus steam shovels. Located Aurora, Illinois. Price each $1500.

30-B Bucyrus steam shovel. Located Charleston, Mississippi. Price $1500.
Box 303-SS.

BUCYRUS ERIE So. Milwaukee, Wis.

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FACTORY REBUILT and USED SHOVELS--CRANES--DRAGLINES

Please send me full details on:

☐ Osgood 1½ yd. Steam Shovel — Bargain.
☐ Bucyrus - Erie — 42-B Steam — 1½ yd. Late Type.
☐ P & H 600 1-yd. Shovel-Dragline.
☐ Bucyrus-Erie 41-B steam 1¼-yd. Shovel. Good condition. Very low price.
☐ Osgood "Conqueror"—Gas Combination Shovel-Clamshell.
☐ Monighan Dragline 60-foot boom. Priced right.

Name.....

Address.....

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Small Shovels
Under 2 Yards
Continued

MARION MODEL 32, shop No. 5459, mounted on "cats," steam-powered, 1¼-cubic-yard dipper, 24-foot boom, 17-foot 6-inch dipper handles. Box 82-SS.

ONE TYPE "B" BUCYRUS-ERIE STEAM MACHINE, mounted on "cats", ¾-cubic-yard dipper, shop number 2301, 19-foot boom and 16-foot dipper handle. Box 83-SS.

BARGAIN

Bucyrus-Erie Type B number 1982, ¾-yard steam shovel on caterpillar mounting with dragline attachment. Ideal for Construction work or Placer mining. Good condition, located Colorado Springs, Colo. Price right. Box 362-SS.

BRAND NEW PAGE DRAG SHOVEL EQUIPMENT suitable for application to Bucyrus-Erie 1030, 1035, or 32-B machines now in the field, consisting of 17-foot 1½-inch boom, 11-foot dipper handle, and two ¾-cubic-yard dippers: one 38-inches wide over cutters—the other 49½-inches wide over cutters, together with auxiliary A frame and ropes. Priced below cost. Box 381-SS.

USED P&H MODEL 700 gasoline, combination shovel-dragline, shop number 3007, including 1¼-cubic-yard drag scraper bucket. Dragline boom 40-foot plus 10-foot extension, shovel boom 25-foot 10-inches, dipper handle 19-foot 3-inches, dipper 1¼-cubic-yard. Engine Waukesha Type WL 4 cylinder 6¼"x7". Good condition. Some repair parts on hand. Machine located Tilleda, Wisconsin. Box 378-SS.

BUCYRUS-ERIE SLIGHTLY USED ½-CUBIC YARD Rope crowd gasoline shovel. Will demonstrate. Box 282-SS.

BUCYRUS-ERIE EXTRA HIGH LIFT B-2 STEAM SHOVEL, 21-foot 3-inch boom, 18-foot 4-inch dipper handle, ⅞-yard dipper, power boom hoist, single shaft "cat." Located Massachusetts. Good condition. Priced very low. Box 385-SS.

BUCYRUS-ERIE 20-B steam shovel ¾-yard Dipper, $850. Chicago territory. Box 348-SS.

THREE TYPE A BUCYRUS-ERIE STEAM SHOVELS. Good value. $500 each.

FOUR TYPE B BUCYRUS-ERIE STEAM SHOVELS. Good operating condition. $1000 each. Box 328-SS.

ONE 18-B BUCYRUS-ERIE, ⅞-yard dipper on full revolving caterpillars. Box 182-SS.

OSGOOD "CONQUEROR" GAS COMBINATION SHOVEL-CLAMSHELL. Brand New. LeRoi 6-cyl. Engine. Excellent condition. Box 412-SS.

NORTHWEST SHOVEL, model 105, caterpillar mounted, 24-foot boom, 1-cubic-yard dipper, 16-foot dipper handle. In good condition. Price $4,500, f. o. b. Utica, New York. Box 34-SS.

REBUILT GA-2 BUCYRUS-ERIE SHOVEL mounted on single shaft caterpillar, 1¼-cubic yard inserted tooth dipper, 22-foot 6-inch boom, 16-foot dipper handle, starter. Carries guarantee of new machine. Box 48-SS.

Lorain 75-B shovel purchased new February, 1932. Worked only six months—just like new. Located in northern New York State. Box 414-SS

P&H MODEL 204. Shop number above 2200 combination Shovel Clamshell. 19' shovel boom, 14' 6" dipper handles, ½ cubic yard dipper, 35' clamshell boom, ½ cubic yard Owens Type M digger type bucket. Both front end equipments less than one year old. Excellent condition. Box 284-SS.

BYERS BEARCAT, Model 27, gasoline ½-cubic-yard Skimmer scoop, crane-clamshell and drag shovel with front opening dipper. Engine—4-cylinder, 4"x5" Hercules Model OX. Machine new July 1928. Excellent condition. Box 293-SS.

TYPE B BUCYRUS-ERIE COMBINATION HIGH LIFT STEAM SHOVEL, 19-foot 8-inch boom, 16-foot dipper handle, ¾-cubic yard dipper, power boom hoist and 36-foot boom clamshell equipment complete. Located central Indiana. Price as is, f.o.b. present location $2,000. Box 311-SS.

20-B BUCYRUS-ERIE DIESEL SHOVEL with 36-foot dragline boom. Machine No. 4133.

20-B BUCYRUS-ERIE STEAM SHOVEL with 36-foot dragline boom. Machine No. 4145.

BUCYRUS-ERIE GAS + AIR CRANE with 40-foot boom, ¾-yard Page Dragline bucket. Fairleads and shovel boom, no dipper stick. Machine No. 4847.

TYPE B BUCYRUS-ERIE High Lift Steam shovel. Machine No. 3110.

Box 373-SS.

RECONDITIONED TYPE-A BUCYRUS-ERIE STEAM SHOVEL on caterpillars, ⅝-cubic-yard dipper, 16-foot boom, 13-foot dipper handle, boom hoist, Massachusetts boiler. Machine thoroughly inspected, worn parts replaced. Guaranteed to be in first class operating condition. Will rent or sell. Box 37-SS.

MARION TYPE 32 FULL REVOLVING STEAM SHOVEL, shop number 4639, mounted on four belt caterpillar type mounting and equipped with standard boom and dipper handle and 1¼-cubic-yard dipper. Shipping point western Virginia.

This machine should be an excellent purchase at the price offered, for quarry or slag bank operation. Box 212-SS.

BUCYRUS-ERIE 1030, ¾-cubic-yard rope crowd gasoline shovel. Factory rebuilt and guaranteed. Box 283-SS.

TYPE B-2 BUCYRUS-ERIE STEAM SHOVEL, number 9830, mounted on single shaft caterpillar type mounting. Equipped with 21-foot 3-inch boom, 16-foot dipper handle, ⅞-cubic-yard inserted tooth dipper. Boom hoist and Mass. standard boiler. Located vicinity of Boston. Reasonably priced. Box 345-SS.

BUCYRUS-ERIE brand new 1035 gasoline shovel, rope chain crowd. Also clamshell or dragline equipment. At price you cannot refuse to consider. Box 356-SS.

BUCYRUS-ERIE GAS + AIR Combination high lift shovel and dragline equipment. Chain drive. "Cats." Very good condition. Located vicinity Chicago. Box 337-SS.

P&H MODEL 600—1-yard Gasoline Shovel. Three years old. Excellent condition throughout. Just been thoroughly overhauled. Will sacrifice at bargain to responsible buyer. Located in Wisconsin. Box 363-SS.

BUCYRUS-ERIE 41-B STEAM SHOVEL—21 foot boom, 15 foot dipper handle, 1¾ cu. yd. dipper. Good operating condition. Box 406-SS

Small Draglines
Under 2 Yards

MONIGHAN 60 FOOT BOOM DRAGLINE mounted on 1-W walking device—Waukesha 5¾x8, 4 cyl. gas engine, also 1¼ yd. Page bucket. Good operating condition. Box 408-SD

P & H Model 206 B Dragline. Good operating condition. Very favorably priced. Box 390-SD.

BUCYRUS-ERIE GAS + AIR combination high lift dragline and shovel. Chain drive. "Cats." Excellent condition. Located vicinity Chicago. Box 337-SD.

BUCYRUS-ERIE E-2 DIESEL DRAGLINE, caterpillar mounted, 50-foot boom, 1¼-cubic-yard Omaha bucket, Kohler lighting plant. Machine was new in July 1930 and has been used less than 6 months. Box 243-SD.

P&H MODEL 700 USED GASOLINE COMBINATION DRAGLINE-SHOVEL, shop number 3007, 40-foot dragline boom plus 10-foot extension and 1¼-cubic-yard drag scraper bucket. 25-foot 10-inch shovel boom, 19-foot 3-inch handle and 1¼-cubic-yard dipper. Waukesha Type WL 4 cylinder 6¼"x8" engine. Good condition. Some repair parts on hand. Machine located Tilleda, Wisconsin. Box 378-SD.

30-B BUCYRUS-ERIE DIESEL DRAGLINE with 40-foot boom and 1-cubic-yard bucket located in Alabama. Box 91-SD.

P & H MODEL 700 DRAGLINE; number 2394 equipped with a 50-foot boom, light 1½-cubic-yard drag bucket, electric light plant, and powered with 4-cylinder Atlas Diesel engine. Box 189-SD.

P & H DRAGLINE MODEL 700; number 2456 equipped with a 50-foot boom, light 1½-cubic-yard drag bucket, electric light plant, and powered with a Waukesha gasoline engine. Box 190-SD.

FOR SALE OR RENT

One practically new Bucyrus-Erie Model E-2 Dragline, Diesel driven, equipped with 50' boom and 1½-yard Omaha dragline bucket, now located at Shenandoah, Iowa. Box 244-SD.

Small Clamshells and Cranes
Under 2 Yards

MARION MODEL 21 HIGH LIFT STEAM CRANE with 40-foot boom equipment including two drums. Also has 20-foot shovel boom, 15-foot dipper handle and ¾-yard manganese steel dipper. Boiler retubed and machine is in excellent operating condition. Located about 15 miles from Baltimore, Maryland. Price for immediate acceptance, subject to prior sale, f.o.b. present location—$1800. Box 396-SCC.

GENERAL 35-FOOT BOOM CLAMSHELL MACHINE and ½-cubic-yard Lakewood bucket. Equipped with four cylinder Buda gasoline engine. Machine new September 1929. Box 335-SCC.

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Small Clamshells and Cranes
Under 2 Yards
Continued

P. & H. MODEL 206 combination clamshell and shovel. Located near Chicago. Good condition. Box 336-SCC.

BUCKEYE CLAMSHELL-CRANE, gasoline driven, caterpillar mounted, equipped with 30-foot boom, ¾-cubic-yard clamshell bucket, fairleads and backfiller scraper. Located in Milwaukee, Wisconsin. Box 371-SCC.

BUCYRUS-ERIE—SLIGHTLY USED LOADMASTER TRACTOR CRANE 14' BOOM— Rubber tired Wheels—Rated Lifting Capacity 4500 lbs. McCormick Deering Power Unit—New machine guarantee. Box 410-SCC.

LITTLE GIANT CRANE—Gas—Caterpillar Model C. Type B—¾-yd. bucket. Recently overhauled. Now working. $1,500.

BROWNHOIST CRANE — Gas — Cats. Model 2-C Serial No. 8829. 1-yd. bucket. Good working condition. $1,500.

McMYLER MODEL J. LOCOMOTIVE CRANE—35 Ton Steam. 50 and 75-ft. Boom. 1½ or 2-yd. buckets. New boiler and swinging engine recently installed. A real crane for long reach and heavy work. Thoroughly overhauled condition. $4,500.

Box 346-SCC.

Large Shovels and Draglines
2 Yards and Over

CLASS 14 STEAM-DRIVEN DRAGLINE. New 1922. Shop number about 3700. Mounted on skids and rollers. Equipped with 60-foot boom, 2-cubic-yard bucket and electric light plant. Located western Iowa. Priced to sell. Box 395-LSD.

50-B STEAM SHOVEL, Number 3946; equipped with 1½-cubic-yard dipper, 26-foot boom, also 1½-cubic-yard dragline bucket with 50-foot boom caterpillar mounted, equipped for burning oil, located at Texarkana, Ark. Price very reasonable. Box 112-LSD.

BUCYRUS-ERIE SHOP REBUILT 100-B STEAM SHOVEL: shop number 4890; 29-foot 6-in. boom; 20-foot handle; three-cubic-yard dipper. Can be inspected at So. Milwaukee, Wis. Priced to sell. Box 187-LSD.

For Sale or Rent

ONE CLASS-14 STEAM DRAGLINE excavator. Number 3402, 70-foot boom, 2-cubic-yard bucket, caterpillar mounted, equipped for burning gas or oil. Priced very reasonable. Located at Grand Prairie, Texas. Box 110-LSD.

68-C BUCYRUS ELECTRICALLY OPERATED SHOVEL, equipped with 2½-yard manganese front dipper, 3 phase, 60-cycle, 440-volt motors, transformers, cable reel and approximately 1400 feet of cable, all in excellent condition. Reasonable price.
Address Box 268-LSD.

6-YD. SHOVEL

BUCYRUS-ERIE 320-B electric shovel, Ward-Leonard control, 3 phase, 60 cycle, 2300 volts, equipped with 6-cubic-yard dipper, 85-foot boom and 58-foot handles. Is in good condition and may be inspected in operation. Reasonably priced. Box 279-LSD.

70-TON STEAM SHOVEL mounted on "cats," caterpillars in good condition. Located near Hazelton, Pa. Box 162-LSD.

50-B STEAM SHOVEL, new March 1927. Shop number about 4950. Has 26-foot boom, 17-foot dipper handle and 2-cubic-yard dipper. Priced to sell. Box 240-LSD.

225-B OWNERS

You may be interested in a partial Bucyrus-Erie 225-B steam shovel located in Kentucky coal fields as a source of spare parts. No reasonable offer refused. Box 211-LSD.

MONIGHAN STEAM DRAGLINE, with 125-foot boom, 3½-cubic-yard bucket, mounted on skids and rollers, located southeastern Iowa. Box 367-LSD.

MONIGHAN DRAGLINE MODEL T, 2-cubic-yard 60-foot boom located near Wichita, Kansas, where it is now working. About seven years old. Has recently been thoroughly overhauled. Box 180-LSD.

DIESEL-ELECTRIC DRAGLINE

Class 14 Diesel electric dragline, Shop Number 5079, new fall of 1927 with 70-foot boom, 2-cubic-yard bucket, and with extra 10-foot extension, western location. Box 296-LSD.

A BARGAIN

All kinds parts for model 300 steam and electric shovels. 6-yard dipper, trucks, dipper sticks, rot. segments, etc., shovels of all sizes.

McCartney Machinery Co.
103 E. Indianola Youngstown, O.

50-B BUCYRUS-ERIE ELECTRIC SHOVEL, equipped with 3-phase A. C. current, 550 volts, 60 cycle and has three motors. New Manganese steel dipper. Located South Carolina. Box 226-LSD.

PRICED FOR QUICK SALE

50-B BUCYRUS-ERIE ELECTRIC DRAGLINE. Located in Texas. Box 416-LSD.

2½-YD. DRAGLINE

Class 220 Page Dragline; 100 H. P. Charter-Horizontal Twin Cylinder engine; 72-foot boom; 2½-cubic-yard Page bucket. Located Northwestern Indiana. Box 200-LSD.

85-C STEAM SHOVEL, on caterpillar mounting, caterpillars in good condition, price $2,500. Located near Hazelton, Pa. Box 163-LSD.

BUCYRUS-ERIE 50-B STEAM SHOVEL, 26-foot boom, 15-foot handles, two-cubic-yard rock dipper. Shop number 9954. Shipped new in 1928. Machine in good operating condition and can be inspected under steam at Eastern Location. Box 397-LSD.

For Sale or Rent

ONE CLASS-14 STEAM DRAGLINE excavator Number 3327 60-foot boom, 2-cubic-yard bucket, caterpillar mounted, equipped for burning gas or oil. Price very reasonable. Located at Turkey Creek, La. Box 111-LSD.

70-C BUCYRUS STEAM SHOVEL on Cats. Complete. In operating condition. Shop number 1712. Also one extra three-yard Manganese dipper. $2,000. Chicago territory. Box 347-LSD.

175-B STEAM SHOVEL No. 4090, equipped with 75-foot boom, 48-foot dipper handle and 3½-cubic-yard dipper. Machine is in very good condition. Oversize boiler. Box 148-LSD.

3-YD. SHOVEL

BUCYRUS 78-C, caterpillar mounted; three-cubic-yard dipper; shop number 3611. Boom rebuilt last year. Equipped with new 103-C boiler and will pass boiler inspection in any state. Shovel is in very good condition and is in operation at present time. Box 326-LSD.

BUCYRUS 320-B STEAM STRIPPING SHOVEL, shop number 4205, new in 1925, used less than four years. Located at Toronto, Ohio. Box 74-LSD.

BUCYRUS 80-B STEAM SHOVEL, shop number about 3800; 2-cubic-yard dipper; 48-foot boom; 32-foot dipper handle. "Cat" mounted. Priced to sell. F.o.b. cars. Box 255-LSD.

TYPE 175-B ELECTRIC, No. 794 equipped with 87' shovel boom, 48' dipper handle, 3½-yd. bucket, and dragline equipment including 125' boom, and 3½-yd. bucket. This machine was recently reconditioned and is in good operating condition. Present location, Connecticut. Box 263-LSD.

BUCYRUS 70-C, Shop number around 1500. Thoroughly overhauled. Good working condition. Eastern location. Box 299-LSD.

CLASS-24 BUCYRUS-ERIE STEAM DRAGLINE, shop number 912; 115-foot boom, 3½-cubic-yard Page bucket. Florida location. Box 73-LSD.

SHOVEL FRONT END for 175-B Bucyrus-Erie 65-foot boom, 47-foot dipper sticks and 3½-cubic-yard dipper. Located in Ohio. Box 10-LSD.

What Do You Bid On a

70-C STEAM SHOVEL located near Marietta, South Carolina, where it completed a railroad job? Bargain as supplementary shovel or as supply of spare parts.

88-C STEAM SHOVEL located in Kansas. Carefully laid up after completing season's work. 3½-yard dipper. Fine condition. Any reasonable offer accepted. Box 52-LSD.

If You Do Not Find What You Want Listed—Write Us

Excavating Engineer
South Milwaukee, Wis.

Miscellaneous Equipment

TWO BARBER-GREENE LOADING MACHINES. Priced extremely low for quick sale. Box 415-ME.

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Miscellaneous Equipment
Continued

LOCOMOTIVES

8 **BALDWIN**, 17x24, straight drive standard gauge 45 ton locomotives. 54 inch boilers. Shop numbers from 32,750 to 34,611. Each one has passed State Boiler Inspection yearly. Boilers will stand cold water test of 240 lbs. At present in actual service in Minnesota mine.

2 **BALDWIN** Locomotives, 19x26, standard gauge, 6 wheel switching type, shop numbers 39534 and 39536. Box 152-ME.

COMPLETE EQUIPMENT for 2 strip mines, contractors or quarry operations, No. 300 and No. 36 Marion steam shovels, well drills, locomotives, cars, crushers, picking tables, loading booms, cable and button retarders, compressors, motors, transformers, flood and search lights, camp equipment and new repair parts for above. Box 195-ME.

FOR SALE

30—2-yard Western Side Dump Cars—24" Gauge
3—Plymouth Gas Locomotive 24" Gauge
2—Miles 35 lb. Rail
Located in Wisconsin. Box 409-ME

4 LA PLANT-CHOATE, 6-yard, all-steel, dump wagons. Equipped with wide iron wheels. Price $200.00 each. Chicago territory. Box 349-ME.

For Sale or Rent

Two 40-ton, 6-wheel switchers. Recently overhauled and rebuilt. Two 50-ton, 6-wheel switchers. In excellent condition. Location Chicago. Box 306-ME.

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Offered for sale by Southern contractor. Priced to sell.

7—Railroad Type Steam Shovels 2½ to 5 yd.
3—Full Revolving Shovels ¾ yd.
1—Gasoline Clamshell Crane ½ yd.
2—Jordan Spreaders.
2—Locomotives, 26 Ton, American Saddle Tank.
32—12-yd. Western Heavy Duty Dump Cars
3—Camp Cars
1—Flat Car
2—1-bag Gasoline Concrete Mixers
Pumps, Boilers, Jacks and Other Tools

For further particulars, Address Box 138-ME.

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For inquiry on supplies and equipment not advertised another postal card addressed to us is provided. Check plainly *only* those items in which you are interested. *Excavating Engineer* will be pleased to serve you in forwarding your inquiry to manufacturers.

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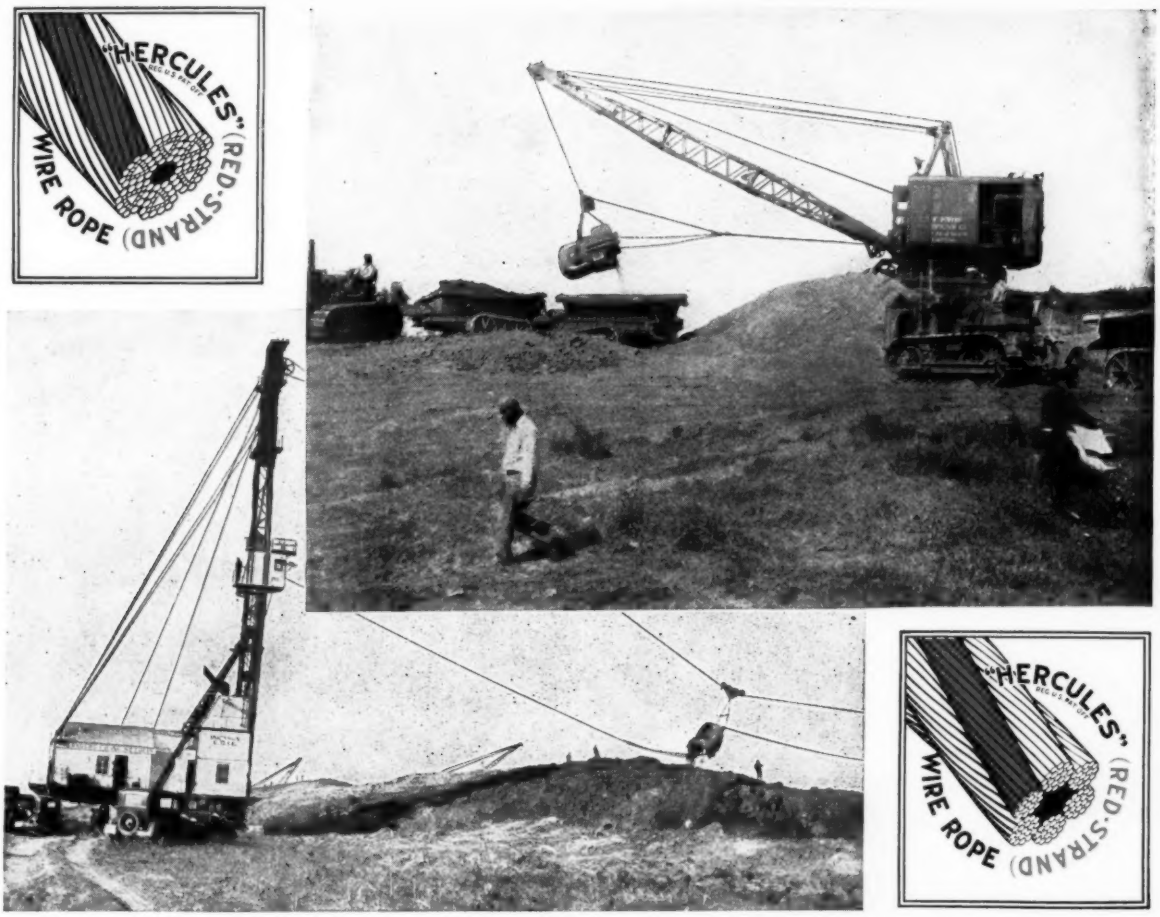

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